No. 15840

United States
Court of Appeals
for the Ninth Circuit

STATE OF CALIFORNIA; UNITED STATES OF AMERICA, et al., Appellants,

vs.

EVERETT G. RANK, et al., Appellees.

Transcript of Record

In Six Volumes
VOLUME V.
(Pages 1737 to 2208, inclusive)

Appeals from the United States District Court for the Southern District of California, Northern Division

(Testimony of William I. Gardner.)

Mr. Rowe: I want to object to the further testimony of this witness too. He has not qualified himself as a hydrologist, he is a geologist, and now he is testifying on [7277] hydrology, and when they get down to testifying that you get water out of silt like you can out of sand, it is time to object.

The Court: Go ahead. Objection overruled.

The Witness: It is what has happened to the material since it was deposited and what happened in the way of sorting of the material so that deposits of sand or silt in which the materials have uniform drain sizes will make good aquifers, that it is the degree of sorting which is exceedingly important in determining the capability of the aquifer, that in places such as this where according to the logs the materials are fine-grained, nevertheless those materials transmit water and good wells are obtained in those areas and from those fine materials, that a well-sorted sand is one of the best aquifers that can be had.

The Court: By "well-sorted sand" you mean sand?

The Witness: I mean a sand in which the grains are of uniform size.

The Court: Such as laid down in the still water or such as laid down in the alluvium by a flowing stream?

The Witness: It would be any place—if you lay the material down in a lake or, say, on the seashore where there is wave action, the waves roll in and go back out again, there is a sorting action

(Testimony of William I. Gardner.)

going on there to separate the finer sizes from the coarser sizes. [7278]

The Court: And leave the coarser ones?

The Witness: That is right, and carries the finer ones out further from the lake or out to sea.

The same thing occurs——

Mr. Rowe: I want to get over here so I can hear correctly that a well-sorted silt is a good aquifer.

The Witness: I am referring to these materials as they are classified and shown on the logs.

And this same sorting action goes on with respect to stream deposits, that where a stream issues from the hills and lays down the materials on the apex of the fan, there is a great variety of materials, they are all intermixed, and that reduces the porosity of the sediment.

It is the same idea that is used in making concrete. In looking for the aggregate deposits we want to get what is termed a well-graded material. Now well graded is the opposite of well sorted. In well sorted the grains are of a uniform size. In a well-graded material that is used for concrete aggregate you want various sizes because you start off with, say, a cobble of six inches in diameter, and if you group these all together you have nothing but cobbles then and you have a very porous mass.

However, you take the next smaller sizes and you put in just enough so that they will fill in the voids between the large 6-inch size, you then

(Testimony of William I. Gardner.)

get the proper amount of the next [7279] size of material so as to fill these voids. You finally wind up with the finest material of all, which is the cement.

Now if you do not have a properly graded material that is better sorted, you are going to have to use more cement because there is more pore space to fill up. If you have a poorly sorted material or a well-graded material you don't have to use as much cement.

The same thing applies to these alluvial deposits, that where they are poorly sorted, the porosity is reduced; where they are well sorted you have a greater porosity.

The Court: If they are well graded?

The Witness: You have a very low porosity.

Mr. McPherson: Referring back now to Mr. Rowe's objection or reference to the fact that one of these wells is abandoned, on examination of Plaintiffs' Exhibit 112 it reflects that Wells 1, 11, 14, were all pumped continuously through the years 1948, '49, '50 and '51, and the gallonage pumped from them is shown on that exhibit. [7280]

The Witness: The permeability of a material will also depend upon the size of the pores.

Now, a clay has high porosity, but it has low permeability, because the pores are such small size that the water will not move through it as readily as it does through materials having larger pores. However, such material as we have been talking about in the City of Fresno wells, the pore sizes

(Testimony of William I. Gardner.)

are large enough and the material is sorted well enough so that there is both good porosity and good permeability of the material, and the water can move through those sediments.

The Court: By the way, I wonder if you would take Exhibit S and just indicate on Exhibit S your line here, C-C, generally.

The Witness: Do you have Professor Smith's pencil?

The Court: Yes.

It is right north of the City of Helm, I see. As I look at it, it is completely outside of Mr. Lee's alluvial cone, except for one small corner, in checking that map.

Mr. Abercrombie: Oh, no, your Honor, it is right through the middle of it.

Mr. McPherson: It is right through the middle, right smack through the City of Fresno and down the trough of the valley.

The Court: Well, I have been checking it against this Exhibit 30. [7281]

Mr. McPherson: There are a lot of things wrong with Exhibit 30, your Honor.

The Court: Well, I mean the line on it.

Mr. Rowe: We may be wrong, counsel, but you won't catch us saying silt or cobbles are good aquifers, and I don't think you will even get the State's witnesses to agree with you on that.

The Witness: Do you want the whole line drawn here, your Honor?

(Testimony of William I. Gardner.)

The Court: Yes, I would just like to see where it is.

The township line between 13 South and 14 South, if you get on the east.

(The witness draws line on Exhibit S.)

Mr. Rowe: May I make a statement: As usual, the court is correct, as it begins to appear here.

The Court: Mr. Abercrombie perhaps has not been following the testimony as closely as I have. The line is completely out of the alluvial cone.

Mr. Abercrombie: Right on his stylized line, if the Court please, goes right along it.

While Mr. Rowe is making a speech, I wonder where this sand came from in the boundary of the two cones, where it is all clay to infinity.

The Court: I don't know that it is clay to infinity.

Mr. Abercrombie: That is what Mr. Lee said.

The Witness: What do you want me to mark this, your Honor? [7282]

The Court: Mark it "C-C' ".

The Witness: C-C' G?

The Court: Mark it C' ' on both ends, YC-YC'.

The Witness: YC-YC'. (Marking on exhibit.)

The Court: All right. You were talking about the water wells of the City of Fresno.

The Witness: Yes. I was mentioning these factors that were taken into consideration in determining the water-yielding properties of the sediments, and I mentioned the sorting action, which is highly important.

(Testimony of William I. Gardner.)

Another factor must be taken into——

The Court: The sorting action occurs when the river is swifter and the gradient is steeper, is that correct?

The Witness: No, your Honor. It is after the materials have been brought down from the mountains, and the stream is flowing at a lower velocity in the valley area, and, having the lower velocity, it must deposit part of its load of debris. And then that occurs during a flood period, when there is a large flow of water down from the mountains; and then, in the subsequent period after the floods have subsided, this material is then reworked by the stream—it is washed around—and the stream then has a chance to select the progressively finer sizes of material and leave [7283] the coarse material behind, and carrying the finer sizes farther and farther out, according to the decrease in the velocity of the stream at the various points down the slope.

That is why eventually they will wind up in the trough of the valley with a high percentage of clay materials.

Another very important factor is the amount of weathering that materials are subjected to, and, contrary to expectations, where we would have the coarsest materials, with the cobbles and so on, they would not be the most permeable materials.

In the older alluvial deposits, where there has been weathering going on for a long period of time, and this weathering action attacks the most vul-

(Testimony of William I. Gardner.)

nerable materials naturally, which are the coarser sizes, it is the cobbles and the gravel sizes that will break down to form clay minerals, rather than the sand, because the——

The Court: "Clay minerals," did you say?

The Witness: Well, yes, sir.

The Court: Well, that is a new one on me. I haven't heard that one, "clay minerals."

Mr. Rowe: What about water minerals, water rocks?

The Court: You mean to form clay?

The Witness: To form clay, yes, sir.

The Court: That is right, I remember everything is rock, including the air.

Mr. Goldberg: Water is a mineral. [7284]

The Court: All right.

The Witness: To form the clay. And that formation of clay will tighten up the gravel and cobble zones, such as we find them on the upper parts of the old fan deposits.

Now, continuing westward toward the trough of the valley, there is a series of wells extending from Well 15-17-36 up to 15-18-2B, that, by inspection, has a very low proportion of sand and a high proportion of clay; and in the upper part of the well—in the upper parts of all these logs there are clays shown which can be matched up from well to well. There is only—well, from Well 15-18-20B, the eighth one from the left, then going northeasterly up the slope, the upper parts of all

(Testimony of William I. Gardner.)

these wells have clay or clayey silts, silty clay, in them.

Underneath that zone there is a zone colored yellow that represents the sands, and——

The Court: Where do they come from?

The Witness: From the Sierra Nevada.

The Court: I mean, how were they deposited, in still water, or——

The Witness: No, these were deposited——

The Court: Alluvial?

The Witness: Yes, these are alluvial.

The Court: All these are alluvial?

The Witness: Yes, sir. These sands can be matched up from well to well.

There is one zone which, starting at Well 15-18-2B and going westerly, there are four wells in there in which the sand beds——

The Court: 15-18-2B; I see it.

The Witness: Yes, sir—in which the sand beds can be matched up and the clay overlying that sand can be matched, from Well 15-18-2B over westerly past the last well which has sand in it, to Well 15-18-3.

The Court: Do you allow that gradient here of eight feet per mile, going south, in matching these up?

The Witness: No, it would be——

Mr. Rowe: Did he say eight or three, your Honor?

The Court: Eight.

(Testimony of William I. Gardner.)

The Witness: Eight. It would be a flatter gradient here, your Honor.

The Court: How much? Well, what did you allow in matching these up?

The Witness: Well, I didn't allow any gradient here, because, if we start at 15-18-21B and go westerly in a horizontal direction—draw a horizontal line across there, and draw another horizontal line along the base of the sands—— [7286]

The Court: Take it clear across there.

The Witness: There will always be sand within that range, and even if we took the low gradient through there we would still find that the line would intersect the sands in the various wells.

Mr. McPherson: I will make the motion, your Honor.

The Court: Very well. We will have the afternoon recess.

(Short recess.)

The Court: While you are drawing lines on that map, it might be a good idea to put these other cross-sections on it, if you can.

The Witness: All of them that we have on here?

The Court: Yes, all of these that you have on Exhibit Y.

Mr. McPherson: Before you put those on that map, may we consider what else we may have in mind as we may decide to put it on another map, because this is a pretty large scale and we had in mind putting some other material on this map.

(Testimony of William I. Gardner.)

The Court: Very well. We will do it with another map then.

The Witness: If I understand, you want a map with these profiles on it and then Mr. Lee's various cone lines?

The Court: Mr. Lee's cone lines and Mr. Smith's alluvial fans, the same as that. It is on several maps around here already. [7287]

However, we will proceed with this.

The Witness: Yes.

I was describing or discussing the sand or clay shown in the upper part of the group of wells in the trough of the valley or for ready reference to the left or southwest of the central wasteway, and I had discussed the sand horizon which I matched up in the four wells from 15-18-2B to 15-18-2A.

We then skipped the next log which shows a high percentage of clay. I notice there are sand beds or zones in here which are not colored.

The Court: That is 15-18-3?

The Witness: Yes, your Honor, 15-18-3.

We then go to the top sand zone in the three wells, 15-18-10B, 15-18-10 and 15-18-10A, and if we start at 15-18-10B and draw a line connecting the tops of the sand in the other two wells we see that it makes an inclined line, inclined to the southwest and approximately parallel to the present land surface so that those three wells, the sand in those three wells, can be matched up very nicely. The sands are thick enough so that the matter of

(Testimony of William I. Gardner.)

gradient is unimportant in matching those particular sands.

The Court: Well, 15-18-9 is about a mile from 15-18-10A, is it not? [7288]

A. Pardon me. I didn't hear you.

The Court: Well 15-18-9 is about a mile, it is in the next section, to 15-18-10A?

The Witness: Yes.

The Court: You have three wells in Section 10 and one well in Section 9.

The Witness: 15-18-9 is along the line of the section and is about a third of a mile away from 15-18-10A as measured along the line in the section.

The Court: Which way does it lay, to the east or west or what?

The Witness: Along the line of the section it is to the southwest because the section line or the line of the section is running southwesterly in this area.

Proceeding to Well 15-18-9 and to the top sand in it, if we draw a line through the wells to the southwest or a line from the top of the sand that intersects sand in the other wells, thick sand zones.

Q. (By Mr. McPherson): Over to what well, Mr. Gardner?

A. Over as far as Well 15-18-17.

The Court: It is clear across, isn't it, and connects all those sands?

The Witness: If we continue that——

The Court: Clear on over to 15-18-30A. [7289]

The Witness: I will draw that horizontal line.

(Testimony of William I. Gardner.)

Q. (By Mr. McPherson): You will have trouble with 15-18-20A, will you not?

A. 15-18-20A, the bottom part of that sand would be intersected by this line, but you cannot be sure that the sand would continue through 15-18-20A because the line as I have drawn it only —it intersects the sand about two feet above the bottom of that sand zone.

However, if we continue the line on farther to the west, southwest, we would find that line going through the thick sand zones and Well 15-18-20 through the next three wells and to the fourth well, 15-18-30B.

Underneath this zone that I have—the several zones which I have traced from northeast to southwest in this group of wells west of the Central Wasteway line, below those sand zones the well logs then show a thick zone of clay which can be connected without any doubt from well to well, and in that way this would illustrate a confined, the picture we would expect in an area where there are confined aquifers. But in this type of deposit the materials have been sorted out and they are laid down in the trough of the valley and the individual zones of clay cover a very wide area, the zones of sand cover wide areas, so that various beds or the various zones can be matched up from well to well and this would, as I say, again illustrate the situation that would be found in an artesian zone. [7290]

(Testimony of William I. Gardner.)

The Court: Actually you take the sand zone in Well 15-18-16A——

The Witness: 15-18-16A, yes.

The Court: ——draw a line across the top of it, and across the bottom of it, and it hits every sand zone in all the wells, beginning with the central wasteway?

The Witness: 15-18-16A?

The Court: A straight line, over across to 15-18-30, the top and the bottom, there is a sand zone in every single well within that area, beginning with Lee 262, of varying thicknesses, but there is some sand zone?

The Witness: Yes, your Honor.

The Court: You draw a line across the bottom, a straight line across the bottom of the sand zone, the top sand zone on that well—there appear to be three of them, but the wide one—and the top of the next sand zone in that well, which is a small one, and those clay beds are found in every single well clear across the whole area, are they not?

Mr. McPherson: Will you indicate the well to well?

The Court: From Lee 262 to 15-18-30A.

Mr. Rowe: 15-18-2A, is it not?

The Court: 15-18-30A.

The Witness: From 15-18-30A, and which was the other well?

The Court: 262. You will find clay? [7291]

The Witness: Draw the line in which position?

The Court: Take the bottom of the sand zone

(Testimony of William I. Gardner.)

in 15-18-16A, and draw a straight line across through all the wells, over to Lee 262; then the next sand zone in 15-18-16A, which is a small one, draw a line across the top of that, through the same wells, and in every single well clear across to but not including 15-18-30C there is a clay deposit, isn't there, of varying thickness?

The Witness: Now I have drawn horizontal lines through the top sand in Well 15-18-16A, through the top——

The Court: Of the sand.

The Witness: ——and the bottom of that sand zone.

The Court: Yes; and a horizontal line through the top of the next sand zone.

The Witness: Yes, that small sand zone; I have drawn a horizontal line through the top, and another one through the bottom of that sand bed——

The Court: I am not thinking about the bottom. I am just thinking about the clay.

The Witness: I see.

The Court: And in every well, beginning with Lee 262, and in that area, there is clay at those levels, of varying depth or thickness, isn't that true?

The Witness: Well, my horizontal line for the lower——

Mr. Rowe: How long is that, your Honor?

The Witness: You want the zone above the small sand? [7292]

The Court: Between the two sand zones, yes.

(Testimony of William I. Gardner.)

The Witness: Yes, there is some clay in Lee 262, then there is sandy—what we call sandy clay and clayey silt in the next well, 261; and then there is clay in all these wells——

The Court: Even including 15-18-30A, or 15-18-30C, every well on the chart until it runs off, except 15-18-30A?

The Witness: Yes, it has silt.

The Court: And 15-18-36 has what you call sandy clay or silt?

The Witness: Yes, sir.

The Court: It is clay?

The Witness: Yes, that would intersect, then, or have within that zone either clay or sandy clay or clayey silt.

The Court: Would that indicate that the fines were sorted out either from the Kings River or San Joaquin River, and laid down there?

The Witness: Yes, sir.

The Court: That would be the edge of one cone or the other?

The Witness: Well, it wouldn't necessarily be the cone.

The Court: Or the fan?

The Witness: It doesn't have to be the cone. It is the type of deposit which is found toward or in the trough of the valley, and feathers out.

The Court: Peters out when it is beginning to slow down so it drops the fines?

The Witness: Yes, just the finer materials.

(Testimony of William I. Gardner.)

Mr. McPherson: So I won't be confused altogether, what did you do with Well 15-18-30D?

The Court: It has sand in it at those levels, also clay.

Mr. McPherson: No, I was mistaken. I was confused as to 15-18-19. That gives me trouble, following you.

The Court: 15-18-19; well, that has got sand, and it has got clay. It isn't a continuous bed of sand, apparently, but there is sand within that level.

Mr. McPherson: I can follow the continuous clay bed from Lee 262 across to that, but I can't follow the continuous sand bed. Maybe I am not colored right, I mean on my map.

The Court: It is there.

Mr. Rowe: I think it is obvious you can follow clay all along the south line of Mr. Lee's alluvial cone.

Mr. Child: Objection, no such evidence.

Mr. Rowe: Well, Mr. McPherson was making a speech; I thought I was entitled to.

The Court: All right, proceed.

Mr. McPherson: I haven't any answer to my question. I can't see——

The Court: Come up here and I will show it to you.

Mr. McPherson: Maybe my map isn't colored as yours is. [7294]

The Court: Here is the line, 15-18-16A. Take that sand bed there, draw a line across the top

(Testimony of William I. Gardner.)

clear over there (indicating); draw a line across the bottom clear over to there (indicating); within every one of these wells here—and here (indicating) is the one you are worrying about—there is sand within that area. It isn't a continuous sand bed, but every one of them has some sand, within that area. There (indicating) is sand, and sand, and sand, and sand, and sand (indicating). Below that, at the bottom of that, there are clays across there, and here is the next sand bed (indicating). So every single one of them has some clay, what he calls silty clay.

The one you are worrying about there is clay; here is clay; here is sandy clay; here is clay; here is clay.

Mr. McPherson: We are not colored the same. I can understand it by looking at the court's copy.

Q. Go ahead, Mr. Gardner.

A. That is all that I had for this cross-section, unless you have some questions.

Q. Can you tell us, is this clay bed, which you have read as existing on the logs shown on Y-3, what has been called in this case the Corcoran clay bed?

A. No, sir. In this area around the trough of the valley, the Corcoran clay is much deeper. It would not show in this exhibit. [7295]

Q. Is there any other area in which you have studied the logs where a clay bed of this length and thickness appears?

A. I don't know of any in the upper part or

(Testimony of William I. Gardner.)

the upper half of the alluvial fan where the deposition conditions have been similar to this where extensive clay beds would be deposited or have been deposited.

Q. What is the length of the clay bed reflected on Y-3 to which reference has been made by the lines drawn by Judge Hall?

A. I would start with Well 15-18-30B and would exclude the well next to it, 15-18-30A, and if you took a horizontal line such as Judge Hall has done and ran it through the top of the second sand of 15-18-16A and through Well 15-18-2B and again excluding Lee 261 with the sandy clays, that distance would be about six and a quarter miles.

Q. And the maximum thickness or depth in feet of the clay bed reflected by these logs, can you tell us what that would be?

A. The maximum thickness of any zone as logged in a well?

Q. Well, I am assuming by your answer to the court's question that you acquiesce in his interpretation of this chart as to the effect that this was a continuous clay bed. I am asking you what the thickness of that bed would be. [7296]

A. I see.

The Court: Well, it is a varied thickness, is it not? It is not an even thickness?

The Witness: No, but I will take an average thickness by running a line through the bottom of the top sand in Well 15-18-2B to the top of the second sand in Well 15-18-30A or through the

(Testimony of William I. Gardner.)

bottom of the third sand in Well 15-18-30D, and take that as an average or the top of that zone of clay.

In some places the clay extends above the line, in other places the sand zones extend below that line.

And then to select a bottom of the zone I would take the top of the sand, the next sand in Well 15-18-2B and run it to the top of the second sand from the bottom in Well 15-18-20.

Now there are some sands above that line but they are helter-skelter through the section. There are some clays below the line. But there is an increase in the amount of sand, the thickness of the sand beds below that line, and as I have drawn it that is a wedge thickening to the southwest toward the trough of the valley, thinning to the northeast, and if by inspection I took the middle, the midpoint in that zone, the midpoint say east and west along the zone and measured that and considered it to be the average thickness in that area, that is 100 feet. [7297]

Q. (By Mr. McPherson): What, in your opinion, if you have an opinion, is the required depth or thickness of the clay deposit of the type found here in order to produce a confined aquifer?

A. May I have the question?

(The question referred to was read by the reporter as follows:

("Q. What, in your opinion, if you have an opinion, is the required depth or thickness of

(Testimony of William I. Gardner.)

the clay deposit of the type found here in order to produce a confined aquifer?")

The Witness: The matter of depth, all that would be required would be for the clay to overlie the aquifer.

The Court: It does not make any difference how thick it is?

The Witness: Well, it must be thick enough so as to establish a continuous sheet across the entire extent of the confinement and that thickness then will depend upon the amount of the irregularities because we can see here there are places where the sand extends below my top line. Or if I had drawn the bottom line in another point there would have been places where the sands would have extended above my line—well, they do, as a matter of fact, in certain wells.

So the required thickness is that thickness which [7298] is necessary so that there will be a continuous sheet of the confining material.

The Court: A continuous sheet of confining material which is continuous over the coarser material, whatever the extend of the coarser material is?

The Witness: Yes.

The Court: If it is 5 foot wide, it has to be continuous for 5 foot; if it is 5000 feet then it has to be 5000 feet?

The Witness: Yes, throughout the entire area of confinement of the aquifer.

The Court: It might be confined in one portion

(Testimony of William I. Gardner.)

of the aquifer, might it not, and not confined in another?

The Witness: Then it would be semi-confined.

Q. (By Mr. McPherson): But the confinement must be on all four sides, top, sides and bottom, is that not correct?

A. The confinement must extend up in the direction of the hydraulic gradient and it would not be necessary for an impermeable bed to be on the sides of the confined zone if the hydraulic gradient was such that it would be running down under the confining bed. [7299]

The Court: Well, is it necessary that the confinement on the top should extend over the entire area of the water-bearing aquifer or sand? As, for instance, if there is a gradient of eight feet per mile, and then water sand or gravel for two miles below a place where the clay comes in, water comes down under that, it is confined as far as that confinement occurs, isn't it?

The Witness: Yes.

The Court: But it isn't confined above, so it doesn't cover the whole aquifer?

The Witness: No, an aquifer can be unconfined in its upper part and confined——

The Court: In the lower part?

The Witness: ——in the lower part, yes, sir.

The Court: So in the lower part where it is confined, you speak of confinement?

(Testimony of William I. Gardner.)

The Witness: That is right.

The Court: And in the upper part it is not?

The Witness: That is right; and it is quite common that the upper part of the aquifer will be unconfined.

The Court: Unconfined. And that is long aquifers and short aquifers?

The Witness: Well, it would be—yes, I wouldn't quibble about the length. There are short confined aquifers which would merge in with the general water table. [7300]

The Court: So that some of the artesian wells which are indicated on that illustrious mapmaker Mr. Hall's map, down in the valley of the Kings, if they are artesian they may have been confined only for a few hundred yards, or a mile or so?

The Witness: If you are speaking of flowing wells, then it is necessary for them to be confined up to a point where the elevation of the head, the intake of confinement is sufficient that, under an adequate hydraulic gradient—there must be a slope even to that pressure gradient sufficient to cause the water to rise up through the wells and flow out.

The Court: In other words, confinement would begin at the point where they escaped the surface of the ground when the aquifer was tapped, the clay?

The Witness: The clay would extend up the general slope and extend over and cover the confined aquifer down the slope. [7301]

* * * * *

Fresno (Field Trip), California; July 16, 1952;

7:15 P.M.

The Court: Let us first get the appearances.

There is Mr. Rowe for the plaintiff; Mr. McPherson, Mr. Bennett, Mr. Hill, Mr. Burton, Mr. Child; then there is Mr. Goldberg, Mr. Ingerson, Mr. Bean, Mr. Gardner, Mr. Lee——

Mr. Goldberg: And the brothers Cobb.

The Court: And Mr. Rank.

Mr. McPherson: And the bailiff.

The Court: Yes, Mr. Scott, the bailiff.

Mr. Rowe: Will you go up and take a look at the water sand? What is here in the foreground, Mr. Lee?

The Court: Let us describe the place where we are. [7305]

* * * * *

The Court: Let us find out where we are and then we will describe it.

Mr. Lee: The northeast quarter of Section 11, Township 12 South, Range 20 East, about a thousand feet northeast of the center of the section and about a little over a quarter mile southeast of Mr. Folsom's house.

The Court: What has been done here?

Mr. Lee: The bluff which we face has been opened up with a bulldozer to remove the soil and earth which has slid down and covered it from above, and in that operation the material below the soil has been exposed, starting from the top and

clear to the bottom level where we now stand, which is about the level of the valley behind us. [7306]

* * * * *

Mr. Rowe: How high is it, Mr. Lee, from where that gravel begins to where we are standing?

Mr. Lee: Approximately 45 feet.

Mr. Rowe: And what kind of sand and gravel is it, water sand and gravel in that 45 feet of vertical face in front of us?

Mr. Lee: It is water deposited from the stream and it is permeable and would carry water by percolation.

Mr. Rowe: Would it be a good conductor of water?

Mr. Lee. It would be a good conductor.

Mr. Rowe: How wide is it, approximately? Do you remember, that you have seen yourself.

Mr. Lee: The bulldozer cut went up and down the valley for about 250 feet opening that sand layer up. [7309]

* * * * *

Mr. Rowe: Mr. Lee, what quality of sand for water wells is this sand in front of Judge Hall?

Mr. Lee: Excellent. [7313]

* * * * *

The Court: Very well. Let the record show that we are leaving here at 8:20 p.m.

(Changing location.)

The Court: Is everybody here? (Assent.)

Go ahead, Mr. Rowe.

Mr. Rowe: Mr. Lee, will you describe the location of where we are standing?

Mr. Lee: We are now on the level of an old canal cut into the face of the bluff on the south side of the bottom lands of the San Joaquin River in the northwest quarter of Section 11, Township 12 South, Range 20 East, approximately one-quarter of a mile west of the center of the section. At this point an excavation has been made with a bulldozer exposing the natural bank on the bluff side of the canal for a distance of almost 400 feet, exposing a face, natural face, [7331] composed of coarse sand with pebbles, water deposited and forming a lens or stratum which is permeable and would carry water, gravity water by percolation.

Mr. Rowe: What quality water sand is this for water well purposes, Mr. Lee, as an aquifer in front of us?

Mr. Lee: It would be very good. It would yield water very readily.

* * * * *

Mr. Rowe: How wide horizontally in the face of this south bluff did you say it was, approximately 400 feet, the exposed aquifer?

Mr. Lee: Approximately; yes.

Mr. Rowe: And is it all good water sand, the length of that 400 feet? [7332]

Mr. Lee: Yes. I walked the length of it and it is.

Mr. Rowe: And how high vertically is this aquifer at the highest spot from the spot that we were standing in the deep cut to the north of it?

Mr. Lee: A little over 30 feet.

* * * * *

Mr. Rowe: Now are these the type of aquifers, that is, the last location and this location, that you referred to as running under the old alluvium into North Fresno?

Mr. Lee: Yes, such aquifers as these are what have been referred to in previous testimony as extending back under the bluffs and southward and such aquifers are exposed along the bluffs here for several miles at different levels with varying thickness and varying widths.

Mr. Rowe: Would you describe this aquifer as excellent, good, fair or poor for carrying water from the river in the direction of Fresno, this type of aquifer?

Mr. Lee: I would call it very good. [7333]

* * * * *

Mr. Rowe: And, Mr. Lee, are these the type of aquifers that you have testified existed below the level of the river bottoms in the "Qo" as referred to by Mr. Gardner in the Old Alluvium?

Mr. Lee: Yes, as indicated in logs of wells which have been drilled both in the area of the so-called Fort Washington Terrace and south thereof, clear through to the south boundary of the topographic cone of the San Joaquin River. [7334]

* * * * *

Mr. Rowe: I would like to offer a picture, an aerial photo, of spot number one, aquifer number one, which we visited last night, exposed on the bluff, as Exhibit 170, and the aerial photo at the

second location visited, on the south bluff of the San Joaquin River, as Plaintiffs' Exhibit 171.
* * * * * [7351]

The Court: They may be admitted in evidence.

(The photographs referred to, marked Plaintiffs' Exhibits Nos. 170 and 171, respectively, were received in evidence.)

WILLIAM I. GARDNER

the witness under examination at the time of recess, resumed the stand and testified further as follows:
* * * * * [7352]

Direct Examination—(Continued) * * * * *

Q. (By Mr. McPherson): Then will you proceed with D-D, which is the Kearney Park-San Joaquin River cross-section.

A. I was going to omit that one. It is similar to others in the middle section of the fan and I have already discussed similar areas.

Q. Very well. Which one do you wish to discuss next?

A. We could proceed to Section F-F.

Q. Which is the Little Dry Creek to Fresno cross-section, is that correct? A. Yes, sir.

Mr. McPherson: These section lines will be put on Defendants' Exhibit H, your Honor.

The Court: Very well.

The Witness: That is Exhibit Y-5.

The Court: Section F-F is Y-5.

The Witness: This profile runs from the northeast corner of Section 24, Township 11 South, Range

(Testimony of William I. Gardner.)

East, in a generally southerly direction a little west of south to the south section line of Section 26, Township 12 South, Range 20 East, where it turns in a southwesterly direction and ends west of Fresno at the southeast corner or nearby of Section 1, Township [7360] 14 South, Range 19 East.

The Court: This line is more or less generally along the line of what Mr. Lee has described as the Fresno side of the river boundary of the Ancient alluvial cone?

Mr. Rowe: More than that, it is inside, isn't it?

The Court: I do not know.

Mr. Rowe: Couldn't he put it on Exhibit S and locate it? Then we could see it.

The Witness: Starting from the river it then in its generally southerly direction runs to a point which is approximately half way between the San Joaquin River and the eastern edge, boundary, Ancient alluvial cone of the San Joaquin River where it then turns, running generally southwesterly, it crosses Mr. Lee's boundary of the Ancient alluvial cone just north of or within Fresno—let me see—in the northeast quarter of Section 29, Township 13 South, Range 20 East, and it terminates within Mr. Lee's Dry Creek cone in about a mid-point measured across the width of the cone.

Mr. McPherson: I would suggest an understanding with the court.

I have located this in my mind as roughly between the Geologic Profile No. 3 and Geologic Profile No. 4 as drawn by Mr. Lee on Exhibit 62.

(Testimony of William I. Gardner.)

The Court: Later on it will be identified exactly, but keep in mind now I just had the thought that it ran along the [7361] approximate edge.

Mr. Rowe: It runs down the middle, doesn't it, between the river? Isn't that your impression?

Mr. McPherson: Mr. Lee's Geologic Profile No. 3 ran practically due north and south, one section westerly from Clovis.

The Court: He has it marked on his copy of the map. Here it is.

Do you wish to see this, Mr. McPherson? It will give you instantly the location.

(The exhibit referred to was passed to counsel.) [7362]

Mr. McPherson: I am looking at so many things, sometimes I don't remember what I see, your Honor.

The Witness: See this red line.

Mr. McPherson: I see. I put it, in my number, between Mr. Lee's geologic profile No. 3, which is here (indicating), and geologic profile No. 4, which is here (indicating).

The Court: Anyway, we know about where it is.

Q. (By Mr. McPherson): Go ahead, Mr. Gardner; let's see if we cannot get along a little faster here.

A. The wells on the left, in the area close to the San Joaquin River, are in the bottom lands and at the edge of the bottom lands of the San Joaquin River.

The first well, No. 11-21-19, is over at the eastern edge of the bottom lands——

(Testimony of William I. Gardner.)

The Court: Across the river?

The Witness: It is on the east side.

The Court: On the Fresno side?

The Witness: It is on the Fresno side, yes, sir.

Q. (By Mr. McPherson): You mean the west side, don't you?

The Court: Well, the river flows south there. It is on the Fresno side, as distinguished from the Madera side.

The Witness: Yes, sir.

Now, there has been projected onto this profile a line, [7363] and the line would intersect the river——

Mr. McPherson: I am all confused. Isn't Well 11-21-19 on the Madera side of the San Joaquin River?

Mr. Rowe: No.

The Witness: If you will look at the line of section, you will note that the section begins on the east side of the river and it runs generally along the bottom lands, and then it dips into the river, and then it comes up again on the bottom lands. Every point where it is on the bottom lands is on the east side of the river.

Mr. McPherson: I stand corrected.

The Court: Well, I don't know how you get this profile at the top here.

The Witness: There is a bend in the river, you see, so the river, in bending around, intersects the profile at a point downstream from Well 11-21-19.

(Testimony of William I. Gardner.)

The Court: At this point shown? Or does it intersect it down here farther?

The Witness: It intersects the profile, according to the location map——

The Court: Oh, about a mile and a half from the beginning of it, is that it? Or is this (indicating) a mile?

The Witness: Yes. However, this profile has not been drawn northerly the full distance of the bottom lands, if our scale is correct on the map.

Yes, it is a mile and a quarter north of the river.

The Court: North of where it intersects the river?

The Witness: Yes, sir.

The Court: All right.

The Witness: And you will notice that at the bottom it is material with a symbol which, from the explanation, is granite. That is a well which went through some of the bottom land alluvial deposits and entered the granite, which is along the edge of the bottom lands at various points on the east side of the bottom lands and also on the west side.

Then leaving the bottom lands, viewing the wells shown from the bluffs southerly, we find they contain great thicknesses of sand and gravel and relatively small thicknesses of clay; and the clay is confined or restricted to very short distances laterally. In other words, the clay zones do not have a great lateral extent, because they cannot be

(Testimony of William I. Gardner.)

matched up from well to well without running into sand or sand and gravel.

In this area it is impossible to find a confining bed which would confine any aquifer for more than half a mile, or more.

The Court: That is in the bottom lands?

Mr. McPherson: Anywhere in the section, I understood.

The Witness: Anywhere in the section. These beds—it would be under a mile, in viewing these logs, on the part of [7365] the section extending down southerly from the San Joaquin River to Fresno.

The Court: Let us see, that would be under a mile along the line of section?

The Witness: Along the line of section, yes, sir, until we reach the lower end of the profile——

The Court: That is, clay beds and sand beds, aquifers or aquicludes or aqui-excludes, or whatever you may want to call them, deposited beneath the surface, follow a general meandering line?

The Witness: The aquicludes——

The Court: Are all of them the confining beds? In other words, your river, in its old channel, meandered much in the same fashion that it does in the present channel?

The Witness: Yes.

The Court: So that any strata, gravel or sand or cobbles, of confinement would not be in a straight line such as you have taken a cross-section here?

The Witness: In an area such as this which we

(Testimony of William I. Gardner.)

are now discussing, which is on the upper part of the fan extending down to Fresno, there are a number of conditions, because there are merging fans which do not readily permit separation or you cannot separate them entirely, because they will merge.

Now, then, we take the upper part of this profile, extending down from the river—— [7366]

The Court: What I am getting at, whatever those beds that are laid down, or whenever they were laid down, they don't lay them in a straight line right down the middle, whether it is an aquifer of sand, gravel, or clay?

The Witness: The sand and gravel deposits, the channel will swerve, but it will not meander in that type of country any more than—I mean it will not meander in wide, sweeping curves, which the term "meander" signifies. It would not curve any more than we see in the present channel of the San Joaquin River, except those times when it would start swinging out and break out through a natural levee to adopt a new channel or break up into its distributaries.

In the process of building up the fan, then, the stream does not swing back and forth over the area. The channel is not restricted to any particular line. In other words, we can't look at the present course of the San Joaquin River, as it is depicted on the drawing, and project that line downward and say, "Now, that has been the channel of the San Joaquin River from time immemorial."

(Testimony of William I. Gardner.)

The Court: The present channel has been flowing many years?

The Witness: Yes.

The Court: And the old channel had flowed there many years before changes were made, before it swerved or swept out or built up, causing a change of direction? [7367]

The Witness: You are asking about clays or confining beds. The bed to be confining must have sufficient extent so that it will cover over the aquifer. If we have holes through the clay bed, then it ceases to be a confined aquifer; and these channel or stream deposits of the sands and gravels, they have been spread over a greater part of this upper part of the fan, and the clays represent a very small part of the total deposit. There will be small lenses, much like we saw illustrated yesterday, last night, where the clay beds are not—fine-grained beds are not continuous.

The Court: Only an inch or two in thickness?

The Witness: Yes, that is right, or a few feet in thickness.

The Court: Depending on how long the river flowed in that particular place?

The Witness: Yes. And, as I say, as we say last night, there was a fine-grained bed which had been cut off when the channel swept down through that deposit, and we found that the coarse sand was deposited on top and at the side, and there was fine sand underneath, that silt bed there.

(Testimony of William I. Gardner.)

Mr. Rowe: May I ask the witness to identify that little strip, about a half-inch, in the clay?

The Court: If I understand you correctly, that was the last spot to which you directed the court's attention, where it was almost white? [7368]

The Witness: Yes.

The Court: And was probably three feet thick?

The Witness: Yes.

The Court: It commenced abruptly, shall I say, and feathered out at the end?

The Witness: Yes.

The Court: What occurred there, in your opinion, was that the clay deposits had been continuous but the river broke through?

The Witness: The river broke through that.

The Court: Through that, and washed that out, and had gone someplace else, and deposited that sand?

The Witness: Yes; and there could very well be other patches of that type of movement.

Mr. Rowe: I am not going to interrupt the witness, but to identify that spot for the record, it was approximately 200 feet downstream from the cut, from location two, into the river bottom.

Mr. Goldberg: Identify it by 200 feet downstream from where we were standing when we first examined the cut through. It was in the area of the cut.

The Court: It is 200 or 250 feet downstream from the cut.

Mr. Rowe: That is the vertical cut through the lower portion of the old canal bank.

(Testimony of William I. Gardner.)

The Court: Yes, that is about right, 250 or something like that.

The Witness: Yes.

The Court: Nobody paced it off?

The Witness: It is a pure estimate.

Well, that is why, your Honor, we cannot conceive of any extensive confining beds in the area shown by this profile and the profile will bear out that conclusion.

Now, then, I went on to state about excepting this southern—well, at the right end of the profile the confining clay beds. There again we can't even be sure that they are confining beds, but anyway the material which is logged as clay could be matched up over a distance of about two miles.

The Court: And that is in the vicinity of the edge of what Mr. Lee described as the Ancient alluvial cone?

The Witness: The Ancient——

The Court: The overlap. I guess that is Dry Creek, is it not, the first one?

Let me see your map again.

(The exhibit referred to was passed to the court.) [7370]

The Court: Well, that would be in area III on Exhibit 62 and it would be approximately the distance from the railroad tracks to the end of your F prime which Mr. Lee identified as being the overlap between—I believe this was Dry Creek?

The Witness: This is Dry Creek.

The Court: Yes—the overlap between Dry

(Testimony of William I. Gardner.)

Creek or interfingering between Dry Creek and the San Joaquin.

The Witness: Yes, the Ancient alluvial cone.

The Court: Very well.

Mr. McPherson: In order that we may have that accurately, will you indicate the well designations which represent that approximate two miles.

Mr. Abercrombie: I had understood that the cone line crossed in the northeast quarter section of 29, 13, 20. If that is the case——

The Court: Mr. Abercrombie, if you will come and look at the red line that he has put on this exhibit here, you will see it immediately.

Mr. Abercrombie: That was his testimony that I had. That is the reason I mentioned it.

The Court: Here is his line, Mr. Abercrombie, that we are talking about, it begins here—see the red line—inside of Mr. Lee's cone.

It turns off down here and gets outside here in the city [7371] of Fresno or at the edge of it.

The Witness: May I point to City Well 31 which on Exhibit Plaintiffs' 62 is within the Ancient alluvial cone of the San Joaquin River and the boundary according to Mr. Lee would be immediately south of City Well 31.

By "boundary" I meant the boundary between the Ancient alluvial cone and the alluvial cone of Dry Creek.

The Court: And the section that I was talking about is these last two miles, Mr. Abercrombie, which would be along this line here. (Indicating.)

(Testimony of William I. Gardner.)

Mr. McPherson: Which line, for the record, your Honor?

The Court: The line of F-F on the exhibit, the copy of Exhibit 62, which is outside the San Joaquin cone and within the cone of Dry Creek.

Mr. Abercrombie: But what I had in mind was the cone line is nearer the Santa Fe tracks and not over near the place indicated. Those wells contain a large amount of sand. That is the point I had in mind.

Mr. Rowe: Maybe we could ask this witness to forego lunch like Mr. Lee and draw them on all of our copies, the cone line.

The Court: It is time for recess now, and if you could take a green pencil—is there any objection to him marking that on the court's Exhibit 62?

Mr. Abercrombie: No, your Honor. [7372]

Mr. Rowe: No.

Mr. Abercrombie: Wouldn't it help, your Honor, to mark on his Exhibit Y-5 as he has done on his own where the cone line falls on that profile, that is, Mr. Lee's line?

The Court: Yes. It doesn't show here. You might do that during recess, if you will.

Mr. McPherson: What I am saying now is in no sense an objection but we are getting to the point where no one's exhibit agrees with the other fellow's and if we are going to draw it on a map I would suggest the sections be put on a map or drawing which has on it the cone lines suggested by Mr. Lee and it be reproduced and copies distributed

(Testimony of William I. Gardner.)

so that we will all have an identical exhibit, otherwise we will get into a quarrel as to who said what.

The Court: I think that is a good idea, and I would like to suggest, in that connection, that when that map is made that the wells that Mr. Lee put on be spotted on that map and that the wells that are here be put on that that are used on his cross-section so that then you will have it complete.

Mr. McPherson: That can be done, and in addition to that we will offer you an overlay which will show a large area of well logging in color which I think will meet the issue raised by your Honor as to the width, an effective demonstration of these section lines.

The Court: Very well. We will have the morning recess.

(Short recess.) [7373]

Mr. Rowe: I might save some time: After my geologist has had an opportunity to look over Exhibits Y-1 to Y-5, I am willing at this time to offer it in evidence as a plaintiffs' exhibit.

The Court: Well, maybe counsel wants further explanations.

Mr. McPherson: I want a lot of explanations, and I will offer the defendants' case subject to any objection counsel may desire to make.

The Court: Commence.

Q. (By Mr. McPherson): Commence, Mr. Gardner.

A. I had discussed the helter-skelter character of the bedding, and how, in the upper part of this

(Testimony of William I. Gardner.)

fan, there are no indications in these logs of confining beds which would have an extent even—up to a mile would be the farthest I would consider a confining bed in that area. Out in the right end of the profile there are clay beds there which can be matched up for a distance of a couple of miles.

The Court: What is that little hump down here, right at Friant?

The Witness: That is in the vicinity of a canal, your Honor, and it may be a sand ridge, which we find in the area.

Mr. McPherson: You said "prime," your Honor; it is at the other end, isn't it? [7374]

The Court: I said "Friant."

Mr. McPherson: Oh, excuse me.

The Witness: As I said when I first began describing this exhibit, these well logs are from wells which are up to a distance of half a mile from the section, and in those cases where there are no wells within that distance we go out a distance of three-quarters of a mile; so that a profile such as this is really showing conditions under a band of the area approximately a mile wide, and does not represent just a narrow line through the area.

I spotted roughly the position of the Ancient alluvial cone of the San Joaquin River postulated by Mr. Lee as being to the right of City Well 31, and I can see no indication from these logs and in this band of country of any vertical barrier to the migration of water, ground water, right or left, across that line.

(Testimony of William I. Gardner.)

Q. (By Mr. McPherson): Now, is that last observation, Mr. Gardner, restricted to section F—F', or is that same answer true with respect to the other sections where they cross the cone lines as fixed by Mr. Lee? A. It is my opinion——

Q. By "the other sections" I mean those that are included in the exhibit marked for identification as Y-1 to -6.

A. It is my opinion, after studying all these various [7375] logs and the geology of the area, the way the deposits have been laid down, that a cone line postulated in this way would not represent the surface expression of an underground barrier to the underground movement of water.

Mr. Rowe: I assume, counsel, your question included line C—C', too?

Mr. McPherson: All of the lines, where it crosses the cone lines fixed by Mr. Lee.

The Witness: My answer is in regard to the theory that these so-called cone lines represent barriers extending underground to prevent, to retard or prevent the migration of ground water throughout or across the line, as represented on the surface by Mr. Lee's alluvial cone.

Q. (By Mr. McPherson): If I understand you correctly, there is not, in your opinion, any indication from the logs of the wells shown on Exhibit Y-1 to -6, or the logs of the other wells which you examined in the area, and the geology which you have done, that indicates to you that there is any

(Testimony of William I. Gardner.)

such barrier or impediment to the free movement of ground water because of the cone line?

A. It is my opinion, after studying all these logs and sections, as I have said before, that from this material, plus the study of the aerial geology—that is, the geology on the surface—that the cone lines as such do not represent [7376] barriers to the underground movement of water.

The Court: Well, are they obstructions or impediments? Take Well 13/20-31L1, which seems to be pretty near all clay.

The Witness: Which one is that one, your Honor?

The Court: On F—F.

Mr. McPherson: To the left of F', the second well.

The Witness: 13/20-31L1?

The Court: Yes. That log appears to be all clay, and likewise the last one there, mostly. Would it operate as an impediment to a part of the flow?

The Witness: That particular well may not be one of the top producers in the area, but, as I tried to point out on these other profiles, the mere fact that the driller, in preparing the log, put down "clay" or "silty clay," and so forth, did not mean that the material would not transmit water.

Now, then, in a case such as this particular well, that material, I should say, would not be as good water-transmitting material as in the well immediately to the left, which is 13/20-31K1.

The Court: Yes.

(Testimony of William I. Gardner.)

The Witness: Yes, that is probably a better-producing well; but I can go over within the area of Mr. Lee's alluvial cone—take Lee 30,——

Mr. Rowe: Take Lee what?

The Witness: Lee 30—which is, oh, a mile and a half [7377] or two miles within the alluvial cone, and——

The Court: It is only marked here as being barely within it.

The Witness: 30?

Mr. McPherson: 30, your Honor. You are thinking of 31.

The Witness: Oh, I am going from the boundary.

Mr. Abercrombie: It is about a mile and a half, across the Santa Fe tracks.

The Court: By Exhibit 62 it appears to be barely within it, less than a quarter of a mile.

The Witness: Yes. Now, there is a well which has clay and sand, and yet it is a producing well; and I go to the wells like Lee 177, which——

Mr. Rowe: I want to object to Mr. Ingerson assisting the witness. I want the witness to go on as long as he will on this line of testimony, and not try to slow him down, if that is the purpose of Mr. Ingerson.

The Court: I think Mr. Ingerson is just looking at 62 to see the location of Well 30. Is that right?

Mr. Ingerson: Correct, your Honor.

The Witness: The well Lee 30 also shows clay with some sand.

The well next to it shows mostly sand.

(Testimony of William I. Gardner.)

If I go down to Lee 108, which is also near the boundary, it shows sand and gravel until we get to the bottom, which is [7378] about 10 feet of clay in the very, very bottom of that well.

So that from that sort of a picture, with clay in one well and sand and gravel in another well, it seems quite clear that the material there has great quantities of sand and gravel in it, and permeable materials. It doesn't appear any more—it doesn't appear to have any greater percentage of clay in it; then, if I looked at the group of wells——[7379]

Mr. Rowe: May the record indicate that he smiled when all the farmers——

The Witness: Right at the area of the fold where there is clay but also other wells showing sand and gravel.

Now you must realize also that this is in the upper part of the alluvial fan and that there is a change in the texture, that is, the size of grain, as I have said before.

We get on the upper part of the cone, and the mere fact that there are cobbles in the material does not mean that that is an aquifer because the sediments have undergone weathering and it can well be that a sand or this material which is logged as sandy clay, clay silt, will yield water as readily as some of the coarser materials which show in the logs on the upper part of the fan. That a well-sorted coarse sand in the lower part of the section or on the profile to the right could very well be a better

(Testimony of William I. Gardner.)

aquifer than something logged as sand and gravel in these other wells.

Q. (By Mr. McPherson): Do you find any uniformity or do you find such uniformity in the logs of the wells lying along the Lee's postulated cones which show a difference in characterization sufficient to cause an impediment, and by "difference" I mean difference from the logs throughout the area with which we are concerned. [7380]

* * * * *

The Witness: Well, if I turn to Cross-section A-A' primed, Exhibit Y-1, I look at the logs on the left, say the group of three logs to the right of the township line, Range 20 East and Range 21 East, and I see in there that the two wells on the right of that a group of alternating sand and clay beds, and I go over to the group of three wells starting with Lee 165 and 13-21-5M1 and 13-21-6R1, and studying these latter three groups of wells I would say there is roughly half of the material below the soil which would be sand.

Those three wells are in the Dry Creek cone and the other three wells to the left are in the San Joaquin River cone. There is a variation of clay material within the San Joaquin River cone too if we took the two wells on the right, 12-20-26B, which has a higher percentage of sand than does 12-20-25. Well, you might on one theory say there is a barrier [7381] going between those two wells.

Well, after studying all these various logs that conclusion is not warranted.

(Testimony of William I. Gardner.)

We look at another well and there is a lot of sand in it, so we can see that the character of the formation changes radically even within the zone, and we could very likely move over a way and find another well which would differ somewhat from these three here because of the variation in the character of the beds.

Now, then, as we move out into the center of such a section we find there is an increase in the clay because it is up closer to the foothills where there has been soft finer materials deposited and there has been weathering and there are small streams contributing to the alluvium in this area closer to the foothills.

However, if I had not spotted the Dry Creek and San Joaquin River and the other cones on here, simply by inspecting those logs I would not have been able to put the position of Mr. Lee's cone.

Q. (By Mr. McPherson): Is that true with respect to all of the sections which you have drawn across the cone lines?

A. That is right.

Mr. Rowe: Not to be facetious, but now we are getting better acquainted, will the record show Mr. McPherson and [7382] the witness are referring to the San Joaquin cone and the Dry Creek cone?

The Court: Let us get on.

Q. (By Mr. McPherson): Mr. Lee's cone.

A. That is true. I have had to locate on here these sections from the map, from Exhibit 62, the

(Testimony of William I. Gardner.)

positions of the cone line where the line of one section would intersect Mr. Lee's cone.

The Court: By the way, on this A-A, I understood the scale of this cross-section was an inch to a mile.

The Witness: On A-A; yes, sir.

The Court: Well, I just took this ruler here and a township is six miles across, is it not?

The Witness: We are going across at an angle, you will see.

The Court: Very well.

Q. (By Mr. McPherson): Now one other thing I wish to be very clear about.

You referred to these sections and the wells, the logs of which are shown on them as a band approximately a mile wide. Do you limit or restrict your opinion and the effect which should be drawn from these sections to the band a mile wide along which the section line is drawn, or how shall we evaluate the significance of these sections as applied to the [7383] entire area?

A. I certainly do not want to give the impression that these lines of sections should only be used to consider the character of the formations immediately adjacent to this line.

They are valid used in connection with surface geologic work and study to conclude that they represent the conditions which we will find throughout this area.

Mr. Child: What do you mean by "this area"?

The Witness: Between the San Joaquin and, in

(Testimony of William I. Gardner.)

this case, the Kings River, or these other sections that have come down through Fresno and the trough of the valley or through Fresno and back up to the Kings River, and so on. That those sections with this other work are valid and can be used in considering conditions in between these various sections which I have been discussing.

Q. (By Mr. McPherson): In the preparation of these sections, Mr. Gardner, did you restrict your study to the logs of the particular wells which are shown on the sections Y-1 to Y-6, or did you also take into account the other logs which are in evidence here as well as the logs shown on the section lines prepared by Mr. Lee?

A. Yes, we have studied Mr. Lee's geologic profiles and——

The Court: Did you study his logs? [7384]

The Witness: And we have studied his logs.

The Court: Did you take those into consideration in forming your conclusion?

The Witness: Yes, sir. All the logs were taken into consideration.

Q. (By Mr. McPherson): Now on that point, in the preparation of these sections Y-1 to Y-6, are we to understand that the wells shown on these sections were particular or selected ones, the selection being designed to produce a given result, or do they reflect all of the wells lying within the band a half mile on either side of the section line or in the isolated instances three-quarters of a mile on either

(Testimony of William I. Gardner.)

side of the section line to which you have made reference?

A. There have been occasions — well, first answering the first part of your question, there has been no attempt at selection. I want to get that in there, that we have tried to get a representative picture of the underground conditions and of the surface conditions and we have tried to the best of our ability to make these sections in such positions that they would show the varying conditions underground in the San Joaquin-Kings River area and to the trough of the valley, and there have been some occasions where we have not used a log. For instance, in projecting the wells onto the line there would be in some cases points where two wells [7385] would come so close together we could not show them on the line and in those instances the selection was to take the deepest well or the— I mean the log of the deepest well — or the log which had the greatest detail, which gave a more detailed description of the materials in that area.

Q. And these logs that lie within the geographical limit of the band that you have described, as I understand it, will be offered in evidence in this case, as well as the logs of those wells?

A. That is right.

The Court: Are not those the ones that you had marked?

Mr. McPherson: No, your Honor. The wells that are bound in that volume together with Mr. Lee's

(Testimony of William I. Gardner.)

wells numbered on the Exhibit Y-1 to Y-6 are the wells which are shown on the sections.

The Court: But not Mr. Lee's wells?

The Witness: No, it does not include Mr. Lee's wells.

The Court: And you will produce those logs?

Mr. McPherson: Those are already in evidence. That is the reason they were not bound in there.

The Court: What was your question a moment ago?

Mr. McPherson: My question was as to whether he said there were instances in the preparation of these sections where they had two wells coming at the same point on the section line and in that case they showed on the sections Y-1 to [7386] Y-6 the deepest well or the one with the most detail.

The Court: In other words, you will produce the other wells?

Mr. McPherson: The other logs will be introduced so that they will be available to Mr. Rowe.

The Court: Very well.

Q. (By Mr. McPherson): Had you finished with your description of Section F-F, I believe it was?

A. Yes, I had finished the Section F-F.

There is one more section, which starts at G in the upper right or northeast corner portion of the location map in Section 30, Township 11 South, Range 21 East, and runs in a south-southwesterly direction to Section 12, Township 14 South, Range 19 East.

(Testimony of William I. Gardner.)

This is along the line of Mr. Lee's Geologic Profile No. 4, and starts in the bottom lands of the San Joaquin River and runs to a point west of Fresno.

This section shows considerable proportion of sand and gravel in the wells making up the greater part of the profile. We can see that there are some three deep wells that have a high proportion of the finer materials in them.

In the shallow wells there is a somewhat higher proportion of sand shown than in the wells along Section F-F, but in general the appearance and general character of the section [7387] is much the same as F-F.

Q. In reading this section do you have an opinion as to whether there exists along the band of this cross-section G-G, or exists any extensive areas in which confining beds appear or could be identified?

A. I wouldn't find any in the upper group of wells. There may be some small ones in the deeper wells.

However, it is my understanding that in regard to the City well which Mr. Lee testified—well, it was in the transcript of April 22nd—in which the deepest well in the cone was some 540 feet deep, that the lower part of the well was not a good producer and that they had to back up to a depth of 175 feet.

I remember that because I was in court at the time and I have used that in forming an opinion

(Testimony of William I. Gardner.)

concerning the deeper beds, that the good water zone is in the—well, it is as depicted by these shallower wells in this area. [7388]

Q. (By Mr. McPherson): Now, with reference to such of the sections Y-1 to -6 as pass in or near the City of Fresno, and on which the City of Fresno wells have been posted, did you take into account, in reading these sections, the evidence given by the City Engineer, Mr. Segel, I believe it was, to the effect that the city wells, spaced as they were approximately 2,000 feet apart, did not show any mutual reaction one to the other of pumping?

A. Yes, I did. I remember that statement.

Q. What significance, if any, did that have, and what opinion did you adduce from it, assuming it to be true?

A. Well, it would be my opinion that wells which tap a confined aquifer, and spaced up to 2,000 feet apart, would show mutual interference; that the reduction in pressure, when they start the pumping, would be reflected in the levels of other wells in the vicinity.

Q. In other words, if the city wells were pumped from a confined aquifer, that is, two or more of them, and the pump was started on one of them, the effect of that pumping would register itself immediately in the other wells, is that right?

A. Yes, if they were tapping a confined aquifer and they both tapped the same confined aquifer, there would be a reflection of the effect of pumping in one well on the other [7389] well.

(Testimony of William I. Gardner.)

Mr. Rowe: I want to reserve the right this afternoon, after checking the testimony, to move that those last three questions and answers be stricken as assuming something not in evidence.

Mr. McPherson: I would be glad to show it to you, Mr. Rowe.

I don't remember if I asked——

The Court: You may have your reservation.

Go ahead.

Q. (By Mr. McPherson): I don't recall, Mr. Gardner, whether I asked you whether section G-G' showed, in your opinion, any continuation of confining beds.

A. Well, taking the good ground-water zone, I don't see that there are any extensive confining beds in that zone.

Q. Have you posted the cone lines, or the location of Mr. Lee's cone lines, on Exhibit Y, whatever it is that shows section G-G'?

The Court: Y-6.

Mr. McPherson: Y-6, I guess.

The Witness: Mr. Lee's boundary between the San Joaquin River and the Dry Creek cone?

Mr. McPherson: Yes.

The Witness: Yes, I have marked the approximate location [7390] here.

Q. (By Mr. McPherson): Where would that come, between what wells on Y-6?

A. As given here, it would be between 13/20-31F1 and 13-20-31.

Q. Without examining the line as drawn on Ex-

(Testimony of William I. Gardner.)

hibit 30 by Mr. Lee, or Exhibit 62, whichever you used as representing his opinion of the location of the cone lines, would you have so identified them from an examination of the section?

A. No, sir. If I was looking for a well or something with some fines in it, I would have gone farther to the right; but there again it is my opinion that they do not represent barriers, because the bedding is broken up, and there are sands of considerable amount in some of those wells—there are four wells in this particular group—and the water could migrate through that area. [7391]

* * * * *

The Court: The Etchegoin is marine?

The Witness: Yes, it is marine, siltstones and claystones. [7501]

* * * * *

Q. (By Mr. McPherson): All right, will you continue with your description of Exhibit AA, Mr. Gardner?

A. I only have one other statement to make concerning this diagram, Exhibit AA, and that is as to the schematic representation of the Young Upland Alluvium, colored in yellow, which is shown extending to the bluff line in the vicinity of Highway 99, and then on various terraces along the north side of the river up approximately midway between Lanes Bridge and Friant Dam.

In the diagram, the Young Alluvium is shown resting on the Old Alluvium, and it is so shown in the terraces scattered along the river; and then the

(Testimony of William I. Gardner.)

Old Alluvium is shown dipping under and finally disappearing beneath, entirely disappearing beneath the Young Alluvium, the so-called Ripperdan surface, downstream from Highway 99.

Now, we have shown it this way to illustrate the position of the Young Alluvium with respect to the Old Alluvium. We do not have definite evidence along here as to the complete depth of the Young Alluvium, and our estimates have been that it would reach approximately half way down the slope of the bluff.

Now, if we could have sectionalized this material, made cuts in it, we could have put these contacts between the Young Alluvium and the Old Alluvium on the terraces, could [7533] have put those contacts in with more certainty. As it is, they are simply generalized, and the Young Alluvium is shown as resting on the Old Alluvium; and the Young Alluvium would not extend beyond the second bluff line, or the bluff line on the inner side of the terrace, or that side which would be farther away from the river. The Young Alluvium would terminate along that second bluff line back from the edge of the terrace.

The Court: By the "Young Alluvium" you use the term "Young" in the same sense that Mr. Lee and Professor Smith use the terms "Ancient" and "Modern"?

The Witness: It is approximately the same, your Honor. The Old Alluvium would approximate the material which is in the Ancient alluvial cone of

(Testimony of William I. Gardner.)

Mr. Lee. Of course, we show the Old Alluvium extending much farther; but Mr. Lee's cone, in which he designated the Ancient alluvial cone, would follow on the Old Alluvium.

The Court: Then all the region of the Young Alluvium and the Old Alluvium, as you have described it, would be what he has described more or less as the Modern and Ancient cones?

The Witness: That is correct.

The Court: In the vicinity of Herndon?

The Witness: That is correct; except, as shown in this diagram, we have this line of Young Alluvium extending southeasterly from Highway 99, and encountering the river upstream [7534] from the railroad bridge.

The Court: Is the Fresno River shown on that?

The Witness: This (indicating) would be the Fresno River, at the upper part of the diagram, and it would be flowing through Madera and over toward the left side.

The Court: And is there a river between that and Dog Creek?

The Witness: Then south of Madera there is shown Cottonwood Creek——

The Court: Cottonwood Creek.

The Witness: ——which is shown flowing toward the left part of the diagram.

The Court: And that flows generally southwesterly?

The Witness: Generally southwesterly, yes, sir.

The Court: In your opinion, is that deposit of

(Testimony of William I. Gardner.)

the Modern alluvium—or do you have an opinion—that occurred from Cottonwood Creek, flowing at one time, or the San Joaquin?

The Witness: Both the San Joaquin and Cottonwood, and the Fresno River, all three, have contributed material to this area in here (indicating).

Q. (By Mr. McPherson): By "this area in here," you mean what?

A. I am speaking of the top, the surface portion of the deposits along the Madera and Fresno Rivers having been [7535] contributed by the Fresno River, and that would merge southerly with the top surface deposits which have been carried in by Cottonwood Creek, and they tend to cut across some of the materials brought in by the San Joaquin River, which followed an old channel at one time which extends now from the bluff line and runs generally northwesterly, generally toward Madera, and then connects with the other deposits of the Young Alluvium in the vicinity of Cottonwood Creek.

Q. Is that channel, former channel of the San Joaquin River, identified on Exhibit AA?

A. It is not identified on Exhibit AA. It is identified on the geology map——

Q. Exhibit V?

A. ——Exhibit V, as the Irrigosa channel.

Q. Was that, in your opinion, a former course of the main channel of the San Joaquin River?

A. I believe that represents one of the former courses of the main channel, yes, sir. [7536]

* * * * *

(Testimony of William I. Gardner.)

Voir Dire Examination

Q. (By Mr. Rowe): What part of this map on the north bank isn't to scale, that is, Exhibit AA?

A. It is all drawn to scale schematically, but I stated in regard to the thickness of the Young Alluvium, or that which was designated "Ripperdan surface" on the diagram, that we did not have information to fix the contact between the Young Alluvium on the terraces and the Old Alluvium.

To illustrate the relative positions of the two, we have shown the contact there on the bluff.

The Court: But what is the scale—is the bluff to [7537] scale?

The Witness: Yes, sir, the bluff is to scale.

The Court: To the scale indicated on the bottom?

The Witness: Yes, sir.

Q. (By Mr. Rowe): Well, right where the Ripperdan material runs into the river, approximately, how high would that area of Old Alluvium be above the material in the river bottoms?

Mr. Abercrombie: I think it has been asked and answered, your Honor. He said he didn't know where that point of contact was, so he couldn't state it.

The Court: No, I don't think that question has been asked and answered. He said that the bluff is to scale.

The Witness: Yes.

The Court: Now, Mr. Rowe's question is, how high above the river bottoms does the Old Alluvium extend before the Young Alluvium comes in? And

(Testimony of William I. Gardner.)

what the witness has referred to, the point on the geologic map, is called——

The Witness: Irrigosa channel.

Mr. Abercrombie: That is just another way of stating the point of contact, isn't it, your Honor, between the old and the new?

The Court: No, let's find out.

The Witness: We wanted to show that this material is resting on the Old Alluvium, but we did not have definite [5538] information on the position of the contact, and therefore it was sketched in here purely to illustrate that the Young Alluvium is resting upon the Old Alluvium, without us actually knowing the position——

The Court: You don't know the thickness, then, of the Young Alluvium in the Irrigosa channel?

The Witness: That is right.

The Court: Is it visible on the bluff?

The Witness: We couldn't differentiate between the two there.

Q. (By Mr. Rowe): The Old Alluvium shown on the bluff just to the right, looking at the map, of the Santa Fe Railroad and under the Ripperdan terrace, is that material drawn to scale there, the brown?

The Witness: I didn't get all that question.

(The question was read.)

The Witness: No, as I say, we do not have definite information on the thickness of the Young Alluvium. So that we could not say from this diagram how thick the Young Alluvium is here and

(Testimony of William I. Gardner.)

how much, if any, of the Old Alluvium would be showing in the bluffs.

This is to represent the relative positions, and not the relative thicknesses, of the formations in the bluff. [7539]

Q. (By Mr. Rowe): Directly perpendicular under the Santa Fe Railroad, is the Etchegoin formation drawn to scale?

A. It is drawn in accordance with what information we could obtain from an oil well, an oil-well log.

The Court: One oil well?

The Witness: Yes, sir.

Q. (By Mr. Rowe): Answer my question, is it drawn to scale?

A. It is an estimate of the thickness which might extend up into this area and finally feather out, in our opinion, in the vicinity of Lanes Bridge.

Q. Well, is the so-called "Tulare formation," directly perpendicular under the Santa Fe bridge, is that drawn to scale?

A. It would be—that thickness there would be determined by the position in which we would put the Friant formation, according to the information we had from the core holes; so that this would represent a residual thickness. [7540]

The Court: Well, is it drawn to scale? That is his only question, whether or not that scale at the bottom applies to that thickness.

The Witness: It would apply to our estimate of

(Testimony of William I. Gardner.)

the thickness of the material in this part of the section.

Q. (By Mr. Rowe): Well, then, it is drawn to scale, according to you, the Tulare formation right perpendicular under the Santa Fe Railroad?

A. Yes, sir. So far as we have a vertical scale, that would represent an estimate.

Q. Now the black line, as I understand it, is the river bottoms itself, the top of the river bottom, and it runs clear across the sheet between the bluffs?

A. This heavy black line running through the central part of the diagram from the vicinity of Friant to the left and generally following along the San Joaquin River down to the vicinity of Mendota, has been generalized so that it would run along the surface of the bottom lands, along the San Joaquin River and between the bluffs.

Q. But not the bottom of the river?

A. But not the bottom of the river.

Q. Now there is a Valley Springs strata here right where this perpendicular black line is——

The Court: Where you change the perspective.

Q. (By Mr. Rowe): ——where you change the perspective, left of Lanes Bridge. Is that drawn to scale?

A. That would represent an estimate of the relative thicknesses of the Valley Springs with these other formations, and in so far as it is drawn to a vertical scale that would fit in with the vertical scale drawn.

Q. For getting the estimate or however you

(Testimony of William I. Gardner.)

measure it, are the Tulare, Friant, Valley Springs, the Ione, the cretaceous, right under where the cross-section turns north of this perpendicular black line, are they drawn to scale? I think you can answer yes or no and then explain it.

The Court: Yes, I think he can say whether or not in his opinion that is the thickness as indicated by that scale.

The Witness: Yes, the thicknesses were estimated and they were drawn on there.

The Court: According to that scale?

The Witness: According to the vertical scale as shown; yes, sir. [7542]

* * * * *

Direct Examination—(Continued) * * * * *

Q. (By Mr. McPherson): Will you please read the specific capacity of wells shown on Exhibit BB and tell us what their significance is geologically?

Mr. Rowe: What number is this exhibit?

The Court: BB, and the transparency is BB-1.

The Witness: In the upper part of the fan area, that is, toward the northeast from Fresno, in the area of the old alluvium, it would be toward the apex of the band. The specific capacities of the wells are characteristically low, of medium size. I note that there are 25, 38 and 34, 49, 75, 29, 30, and then there is one which departs from that general low figure, 223.

Now those low specific capacities are general in this apex area of the fan.

(Testimony of William I. Gardner.)

If we proceed southwesterly toward Fresno, there is a group of wells in the Fresno State College which have a much higher specific capacity, and they run 106, 91, 111, 123, 138, 182.

And then in the city of Fresno, or to the southeast of that group of wells, to a group of three well——

The Court: In cone No. IV of Mr. Lee's cones?

The Witness: To a group of wells, yes, in cone IV according [7553] to Mr. Lee, which is in Township 13 South, Range 21 East, there is another group of three wells, specific capacities 66, 114 and 163.

Then going southwesterly into the city of Fresno——

The Court: Still within what cone on Exhibit 62?

The Witness: We find that the wells occur in alluvial cone II, Ancient alluvial cone of the San Joaquin River, as designated by Mr. Lee, and III the alluvial cone of Dry Creek and No. IV is the alluvial cone of Dog, Red Bank and Fancher Creeks, and then southerly along the south township line of Township 14 South, Range 20 East, there is another group of wells which would be in Mr. Lee's Kings River cone.

Now, then, as I examined the group of wells on the east township line of Township 13 South, Range 20 East, I find that the cone line as outlined by Mr. Lee between cone II and cone III to pass through wells having specific capacities of 106 and 138,

(Testimony of William I. Gardner.)

which are among the—well, one is the second high and the other one is about the average for the group—and I find that the wells along that line——

The Court: Well No. 3 is within cone II, is it not?

The Witness: Well No. 3 is within cone II; yes, sir.

The Court: With a specific gravity of 182?

The Witness: Yes, sir, and it is showing a higher specific gravity — this entire group of seven wells shows a higher specific capacity—than do the wells in the apex [7554] area of the cone, much higher, which would indicate that the materials in this area here are better aquifers than are the materials in the apex area.

Q. (By Mr. McPherson): I don't want to interrupt you, but this is not another case as yet. You used the term "specific gravity." I take it that that was a slip of the tongue?

A. Yes, I should say "specific capacity."

If we then move to the wells in the city of Fresno we find that the boundary line between the Ancient alluvial cone and the one of Dry Creek passes through wells with a specific capacity of 110, 160, 163 and 173, which represents the highest specific capacities of the wells in the area. [7555]

The Court: The line passes through those wells, or are they within the Ancient cone?

The Witness: They are right along the line, either side of it, your Honor.

(Testimony of William I. Gardner.)

The Court: Along the line. Well 42 is the one within, is that it?

The Witness: Well 42 is approximately one mile within the Ancient alluvial cone.

The Court: I see.

The Witness: I then note the specific capacities of the wells to the southeast of that proposed cone line, which would be within the alluvial cone of Dry Creek, and I find they have specific capacities of 159, 159, 96, 126, until I reach——

The Court: 88?

The Witness: 88.

The Court: And 82?

The Witness: And 82; and then I reach the boundary or the vicinity of the boundary between cone 3 and cone 4—that is, between Dry Creek and Dog, Red Bank and Fancher Creeks—and here the specific capacities on either side of the line, say out to a half mile or so, would be 137 and 166 on the Dry Creek side, 200 on the Fancher Creek side, 124 on the Fancher Creek side; 81 is about a mile; 78 is close to the boundary, and then there is 147 and 143 on the Fancher [7556] creek side of the boundary, and 124 on the Dry Creek side, these last being about three-quarters of a mile or so from the boundary.

Then moving to the Fancher Creek cone, I find there are specific capacities of 103, 193, 57, 97, 140, 218, 76, 159, 119, 114, 117, 167, 96, 159, so distributed that they don't show any relation—so distribu-

(Testimony of William I. Gardner.)

ted geographically that they don't show any relationship to the cone lines, and with such numerous high specific capacities—and even the lowest ones being of moderate specific capacity—that the conclusion would be that the materials in the area of the City of Fresno, this area which I have been describing here in the two cone lines, all these materials in here (indicating), are of such a nature that wells can be drilled into them and good to excellent wells can be obtained, as compared with the generally low specific capacities in the apex area.

A study or inspection of the specific capacities in these wells would belie any opinion that there are barriers to the horizontal movement of water through this area, because right along the immediate vicinity of these cone lines we find excellent wells, and the distribution is general throughout that entire area. I cannot see any pattern there of bands of good wells and bands of poor wells.

Q. (By Mr. McPherson): Do you have an opinion, Mr. Gardner, as to whether [7557] the formations, the depositions, the deposits of the underground geological structure, or whatever is the correct appellation of it, forms any impediment to the movement laterally of underground water across these various cone lines as they have been postulated by Mr. Lee?

A. No, I find no evidence that there are barriers running across the country which will prevent the underground movement of water.

(Testimony of William I. Gardner.)

The Court: Would it impede the underground water?

The Witness: I find no evidence showing that there is a general area or line along which movement is impeded.

There are small local areas where there is some restriction, naturally, because the materials are heterogeneous and there are variations in the deposits; but to conceive of a barrier running across the country, I just can't conceive of it.

Q. (By Mr. McPherson): Now, these small local impediments which you refer to, do they follow generally the cone lines, as postulated by Mr. Lee?

A. No, I think there is a general improvement in the character of the materials in so far as their water-yielding properties are concerned, from the cone area or the apex area out into this area such as we find around Fresno, where there has been better sorting of the materials and there is not the [7558] weathering and cementation of the materials such as we find in the apex area of the cones.

Q. To what do you attribute the smaller specific yield of the wells in the apex of the fan, as compared with those down in the region of Fresno and westerly from that?

A. Well, I think there has been greater weathering of the materials in the apex area, which causes the breakdown of the minerals and the rocks in the materials, and this breakdown leads to the formation of clay and cementing materials like silica, and they do not have the porosity or the water-

transmitting capacities of the better sorted materials that are found toward the mid-portion of the fan. [7559]

Q. Is there any pattern direction in your opinion that we may consider represents the gradually improving permeability of the underground structure and, if so, does it have a course and direction?

A. Well, I think that there is a gradual improvement in the character of the beds, of the formation, away from the apex area of the cone and away from the eastern edge of the valley, which is also underlain by very old alluvial materials.

Q. Now is that true, Mr. Gardner, with respect only to the area shown within Mr. Lee's postulated cone line area No. II or is it true also and in like fashion of all of the cones he has depicted on Exhibit 62 and from which this overlay was made?

A. Well, in my opinion, that conclusion would apply also to the area north of the San Joaquin River. It would not just apply to the area south of the San Joaquin River as is shown on that overlay in the Ancient alluvial cone, but the apex area of the Ancient cone on the north side of the river would also contain materials that would not make good aquifers.

Q. Can you at this point indicate on Exhibit BB the easterly or northeasterly boundary approximately of the Corcoran clay deposit which we were discussing last Friday, just an approximation of it? I should like to ask some questions [7560] about it and I don't want to refer to the other map.

(Testimony of William I. Gardner.)

A. The easterly limit where we have definite information is from our core hole in Section 35, Township 35 South, Range 15 East, which is approximately four miles east of the town of Mendota.

Q. On Exhibit BB, there are a group of wells in that Township 13, Range 15, and to which you have just made reference and which have not been read by you in your description of the exhibit. Can you tell us the source of that material and the significance of those readings?

A. Those wells belong to the Farmers Mutual Water District and they occupy a small area south of the San Joaquin River in Sections 25 and 26, Township 13 South, Range 15 East.

Their specific capacities are moderate, low to moderate. They run 48, 51, and the highest being 88.

Mr. McPherson: Maybe we had better get a definition of the terms "low" and "high."

The Court: I think so. You have used the terms "low," "moderate," "excellent," "high," "good," "fair."

The Witness: Well, I was using "very low" or "low" in connection with specific capacities of 38, 25, 34——

The Court: What is the range, 25 to what?

The Witness: I would say up to 50. And "moderate" would be up to 90 and a hundred. And over a hundred would be [7561] "very good."

Q. (By Mr. McPherson): I see also there are two wells, Nos. 15 and 16, in Township South, Range 17 East, on Exhibit BB, and also the wells

(Testimony of William I. Gardner.)

in Township 14 South, Range 18 East, to which no reference has thus far been made.

Can you tell us the source of that material?

A. Those are wells from which data was obtained from the Fresno Irrigation District, and the one in Township 14 South, Range 18 East is very high, has a capacity of 241.

We get a little lower specific capacity out toward the trough of the valley in these wells which are penetrating the finer trough sediments.

Mr. McPherson: Do you have any questions on voir dire?

Mr. Rowe: Yes, I would like to ask some, if I may.

Mr. McPherson: Let me ask a question:

Q. Have you completed your description of the exhibit? A. Yes. [7562]

* * * * *

Q. (By Mr. McPherson): Do you find apparent on the Exhibit FF, on the south or Fresno side of the river, a ridge such as you have described, in the contours on the Madera side?

A. There is such a ridge starting on the eastern side, north of the City of Fresno, in Township 13 South, Range 20 East, and running in a general westerly direction down to the vicinity of Section 11, Township 13 South, Range 17 East; and, as I come down that ridge, I note that there is a flow to the northwest toward the San Joaquin River, and to the southwest toward the trough of the valley, and in the vicinity of Biola, in Township 13 South,

(Testimony of William I. Gardner.)

Range 13 East, just to the north of Biola, to the river, I see we have an arrow which indicates a minor contribution to ground water beyond the bluff line. It looks like it might extend a quarter of a mile south of the bluff line in that particular area.

And there is another small area in Section 2, Township 13 South, Range 18 East, where there is apparently a contribution beyond the bluff line, southerly, for, oh, maybe an eighth of a mile or so.

* * * * * [7595]

Mr. McPherson: During the recess I asked Mr. Gardner to draw on Exhibit FF the extension laterally of the ground water ridge on the Fresno side of the San Joaquin River, which he appears to have done in a blue pencil.

Q. Will you legend that, Mr. Gardner, so we can identify it?

The Court: The extension?

Mr. McPherson: The extent.

The Court: I see.

Mr. McPherson: As Mr. Lee did for me also on a similar matter.

The Witness: I will label it R, for ridge.

The Court: Put a "G" after it so we will know it is Gardner.

The Witness: R-G. [7596]

Q. (By Mr. McPherson): Now will you continue to give us the facts upon which you base the opinion that the San Joaquin River made no con-

tribution to the area south and east of the line G-G-1 as it appears on Exhibit FF?

A. Yes, sir.

The ground water contours show the surface of the saturated zone and of the water table and the slope of that surface shows the direction that the water will flow underground, and the water flows downhill. It is free water. It is not in a pipe and could be forced up in elevation from some higher source of water. It is not confined, it is free-flowing water which obeys natural laws and it obeys natural laws whether it is on the surface of the ground or underground.

The San Joaquin River flows downstream and the underground movement of water likewise flows downstream, down the slope of the water table and the ridge which I have indicated in blue and labeled R-G, represents a barrier to the movement of water southerly from the river because the water is going to flow down the slope and if the water was to flow southerly from the river it would have to flow uphill, which is an impossibility.

This map indicates, to repeat again, the surface of the water, the ground water. [7597]

Now, as I have said before, in the upper part of the fan the Fresno plains, the easterly portion of the Fresno plains, the geology is such as to show, I think conclusively, that we do not have extensive confining beds. We may have tight beds for a matter of a mile or two but we do not have con-

(Testimony of William I. Gardner.)

fining beds extending for many miles such as we have in the trough of the valley.

The only way in which water would be able to flow southerly from the San Joaquin River underground would be for the water to be in some confined channel. If it extended under the ridge or if this channel extended under the ridge, the pressure of the water along that ridge would tend to move the water back toward the river again because from the ground water ridge to the river is the direction of the slope of the water and the pressure exerted by the water on this ground water ridge, the vertical pressure here downward, is greater than the pressure exerted from the river to the north because the water on the ridge is at a higher elevation. And the data indicates that the flow of water in this area to the north of the San Joaquin River and into the ground water trough there is a result of pumping.

Q. You mean to the trough of the Madera side?

A. On the Madera side.

That trough in the water table was formed by pumping. In a state of nature the drainage, or the movement of ground [7598] water, was toward the river from Madera, the Madera side, toward the San Joaquin River.

Likewise on the south side in Fresno it would be from the upland area toward the river.

Q. That situation still obtains on the south or Fresno side of the river over to the area legended

(Testimony of William I. Gardner.)

G-G-1, and by the "area" I mean the dashed line on this exhibit? A. Yes.

Q. Do you have an opinion as to what produced or caused the contribution to the underground as it was made by the river to the area lying between the dashed line G-G-1?

A. Yes, there has been pumping in the area which has pulled down the ground water levels and allows the water to flow southerly into that pumping low.

Q. You referred a moment ago to the upper portion of the fan or cone, as Mr. Lee has described it, which you based your opinion that there was no confining structure or no confining beds of any extent greater than a mile or so.

Can you tell me whether, in your experience, any river such as the San Joaquin, having a cone or fan, whichever it is properly called, there has ever been found to exist a confined or semi-confined aquifer, leading from the river carrying water in a direction contrary to the slope of the ground water table?

A. I don't know of any such type of current in deposits [7599] of this character. As I have repeated before, the geology of these beds is contrary to their being confined channels in this easterly portion of the Fresno plains area. [7600]

Q. And by "the easterly portion," so we can correctly appraise your testimony, what do you mean? In other words, where would that line be drawn, roughly, north and south, to divide the east-

(Testimony of William I. Gardner.)

erly portion, I take it, from the westerly portion?

A. Well, in one of the early Water Supply Papers by Mendenhall, there was a line showing artesian wells, and it would be in the vicinity of Kerman here, and running generally northwesterly. Kerman is near the northeastern corner of Township 14 South, Range 17 East. So from that point southwesterly, there are confined beds, confined aquifers.

But when we go to the east of that line, then whatever confinement there is is purely local in character.

Q. Is it such confinement, in your opinion, as would permit the transmission of water in a direction contrary to the slope of the ground-water table?

A. No. I believe the arrows, as shown on this map, Exhibit FF, indicate a flow, the underground movement of the water in that area I am speaking of, the unconfined area; and I do not think that there are confined aquifers in this eastern part of the fan in which the flow of water would be contrary to the direction indicated by the arrows.

Q. Do you know of any text or writing on the subject of geology or underground-water supply in which such a theory has ever been advanced?

Mr. Rowe: What theory?

Mr. McPherson: The theory he was just asked about, whether in the type of area of the upper portion of this cone or fan any such aquifer exists as would move water contrary to the direction of the slope of the underground water table.

(Testimony of William I. Gardner.)

The Witness: I don't know of any such examples.

Q. (By Mr. McPherson): Now, with reference to the area on the north side, or the Madera side, of the river, does your study of the geology and the hydrology of the area indicate the existence of any aquifers, confined or semi-confined, that would permit or from which you could determine that the water moved in a direction contrary to the slope of the ground-water table?

A. No, there is no evidence to show that the water moves otherwise than as shown by the arrows, in Madera County.

Q. Now, other than the water-contour map, Exhibit FF, and the—Strike that.

Do I understand that you have studied the water-contour maps which have been introduced in evidence as Plaintiffs' Exhibit 73, and I think one or two of them took a separate number, all produced by the State of California?

A. Yes, I have studied them.

Q. In addition to those contour maps of the underground-water table, and Exhibit FF, which I believe was prepared by the Bureau under your direction—— [7602] A. Yes.

Q. ——and the general geological studies which you have outlined here, what other factors, if any, were considered by you in determining the—in making the determination that the San Joaquin River did not feed the underground-water table south of the river beyond the line "G-G"?

(Testimony of William I. Gardner.)

A. We had data of levels in deep and shallow wells in the area north of Fresno, which stood—or the elevations in the deep wells are comparable to the elevations of water in the shallow wells, the differences being accountable for by the slope of the water table.

If there were deep, unconfined—or deep, confined aquifers, then that should be indicated by differences in the elevation of the water level in wells of different depths; and we have studied what we call paired wells, the deep and the shallow wells, north of Fresno, and, as I said, the elevation is the same, regardless of depth, except for the slope of the water table.

The Court: You mean the standing-water elevation?

The Witness: The standing water, yes, sir.

The Court: Except for the slope of the water table?

The Witness: Yes. For instance, if a well was located on contour line 300, the level of the water in the well would be at elevation 300. Then if we had another well a quarter of a mile westerly which, I will say, was a shallower well, [7603] and the elevation of the water in that well stood at 298, well, that would be the slope of the water table.

In other words, the water table itself is sloping westerly, so that there naturally then would be a difference in the elevation of the water in the two wells, because of their geographic position. But

(Testimony of William I. Gardner.)

that difference would not be because of differences in pressure in the wells.

If they were pressure—if one was a pressure well and the other was a water-table well, then we would expect differences in the elevation of the water in the two wells; but from our experience we find that what differences there are are just what we find in wells as we measure them to determine the elevation of the water table. It is the slope of the water table.

So that, although there are these local confined aquifers, they are so small that they blend in with the body of ground water in this eastern part of the Fresno plains area, and we would consider it as one body of water with these minor differences in transmissibility of the formations, but the differences not being great enough so that one body would become separate from another. We do not find independent water bodies in this eastern part of the Fresno plains area.

The geology also is against this matter of there being more than the small, local, confined bodies of water, or semi-confined. There is nothing in the geology which we have found [7604] here to show that there is any extensive confined aquifer leading under—or leading from the river down to Fresno. [7605]

Q. And by "extensive" you mean what?

A. Well, it would have to be a matter of several miles.

(Testimony of William I. Gardner.)

Q. I mean, what do you mean by—you say there are no extensive——

A. I have been limiting it to at least at the most two miles.

Q. I just want to be sure we are referring to the same thing.

A. And in order to have an aquifer bringing water from the San Joaquin River to Fresno, that aquifer must start at a point where it will have a high enough elevation so that water would flow down to Fresno. It can't start over here at Herndon and flow to Fresno, it would have to start in this upper reach of the river a few miles below Friant.

Q. You mean the city of Fresno when you say "Fresno"?

A. I am speaking of the city of Fresno.

Now there is granite exposed along the sides of the river bottoms on the north side and it crops out at various places on the east side of the bottom lands. There is some small outcrops of granite on the north side of Dry Creek near the mouth of the San Joaquin River.

There has been granite encountered in some of the wells south of the bluff in the—well, it would be in the general portion of the northeastern portion of 12, 20, and possibly [7606] the western part of 12, 21 East, so that the channels, if there was such a thing, would have to start up in this area.

Q. By "this area" you mean what?

A. Near the mouth of Dry Creek, flow down to

(Testimony of William I. Gardner.)

Fresno, which would be a distance of roughly 11 or 12 miles.

Q. What, in your opinion, would be required as a minimum gradient in order to move water that distance contrary to and against the slope of the water table, assuming the aquifer were wholly confined?

A. Yes. It should have about the same gradient as is shown by these contours in the eastern part.

Q. Which is what?

A. In the eastern part of the fan, say in the eastern portion of Township 12 South, Range 20 East, and there is nothing magical in the underground why it should be more permeable than is shown by these contour lines.

This represents the gradient needed.

Q. And by "this" you mean——

The Court: When the contour lines are close together it means that there is a tight formation and when they are far apart it means that there is a loose formation?

A. Or there is a good supply of water, there is irrigation ditches coming around through here. Yes, your Honor. That would be true, that these are tighter beds than we find, say, in the vicinity of Fresno where the gradient flattens [7607] out, or there is another modification to that also, a heavy draft will steepen up the ground water contours.

Q. (By Mr. McPherson): You still haven't answered my question.

(Testimony of William I. Gardner.)

A. Yes, I am getting to that.

In the area east of the river and Township 12 South, Range 20 East, if I measured, say, for two miles there —

Q. Perpendicular?

A. Perpendicular to the contours, because that is the direction in which the water is flowing, I find that there is a difference in elevation on the ground water surface of 25 feet, which would be an average of, say, 12 feet to the mile.

If I went further to the west and took it in the vicinity of Fresno on the Fresno side of the ridge I find there about 15 feet in two miles, which would be 7½ feet per mile, which, if you took the average of the two, that would be 10 feet per mile. And that, by the way, happens to be about the average slope of the water table which we generally assume if we are just making a quick estimate, 10 feet to the mile, and I believe that would be a reasonable gradient to expect to find in an artesian aquifer necessary to move the water through these tighter materials.

The Court: You think this ground water ridge is built up here by the introduction of surface water? [7608]

The Witness: I think that that particular configuration, as we see it, where I have marked the ridge line in blue, reflects the introduction of Kings River water.

The Court: On the surface?

The Witness: Yes.

(Testimony of William I. Gardner.)

The Court: By irrigation?

The Witness: Yes.

The Court: Now if this map were made, say, on the 1st of June before irrigation began and when the San Joaquin was in flow, would these contour lines in your opinion be the same?

The Witness: Yes, that ridge would still be in existence, I haven't seen any map——

The Court: Have you seen any map taken in the spring?

The Witness: Yes.

The Court: After a flood, after a high flow and before the commencement of irrigation?

The Witness: I have seen maps for the spring of the year and the ridge is still in existence.

The Court: What, 1951?

The Witness: 1951; yes, sir.

The Court: 1951 was a year which followed a number of years of rather light rainfall and flow in the river?

A. I do not know what the flow in the river was at that time. That would be in the winter of '50-'51. [7609]

The Court: Well, a series of years when the flow of the river was smaller than that, they have been talking about it in the paper, about having a series of dry years and this being the first wet year for some time.

The Witness: Yes, the flow of the San Joaquin River has been below normal since 1946, I believe.

(Testimony of William I. Gardner.)

Likewise the precipitation was below normal generally from 1942 until 1950.

The diversions of Kings River water into the Fresno Irrigation District were likewise below normal for 1946 until 1949.

Q. (By Mr. McPherson): But the fluctuation and flow of the stream, the San Joaquin River, being seasonal as the court's question embraces, does that affect the surface of the ground water table in the area south of the river, in your opinion.

A. It does not affect the area south of the river. There is an effect noticed in portions of the area to the north in Madera County where the water table, the trough line there, moves downstream and there is a rise in the water table north of the river in this eastern part of the plains area indicating recharge to this area from other sources than the river, which also has indicated to me that the San Joaquin River was in this easterly portion, say east of the railroad, or even going down to this point down in here around where the trough line of the south takes off, in the [7610] state of nature this was a drainage stream.

Q. And by "this" you mean what?

A. The San Joaquin River. [7611]

Q. From what point to what point?

A. In the upper portion, starting right at Friant.

Q. And continuing for how far?

A. And going on down into the trough of the valley—was a draining stream; that is, ground

(Testimony of William I. Gardner.)

water was contributing to the flow of the river, rather than the river contributing to ground water.

Q. From your study of the ground-water contour maps, can you tell us when, if you recall at the moment, the river first commenced losing water to the area south, and in the Fresno district between the river and the point or portions of the area to the line "G-G"?

A. To the best of my memory, it was in '46 or '47 that the contribution to the south began.

Q. Then, prior to that time, did the river make any contribution to the underground-water table to the south, or on the Fresno side, that is, during the period covered by any ground-water contour maps which you have seen?

A. Not that I can recall now.

Q. Now, you have told us, based on the geologic studies which you have made and the hydrologic readings you have given and studied, the limits to the contribution of the underground-water table.

I will ask you where, in your opinion, are the sources of the underground water in the area between the Kings River on [7612] the south, the Fresno Slough on the west, and the San Joaquin River on the north——

Mr. Rowe: I will object to that.

Mr. McPherson: Just a minute. Let me finish my question.

Mr. Rowe: All right.

Q. (By Mr. McPherson): ——and the foothills of the Sierra Nevada.

(Testimony of William I. Gardner.)

Mr. Rowe: I want to object to that, on the ground it is certainly not proper examination of this man. Why, they haven't even made a complete section of anything, like the court said. They just show the San Joaquin, and from that the Kings River——

The Court: What is the ground of your objection?

Mr. Rowe: On the ground it is an improper conclusion to draw from this map.

Why don't they draw the whole thing; instead of using a cross-section across the valley, they stop before they even reach Herndon. I want to bring that out on cross examination, but there is nothing on this map from which he could make that conclusion.

The Court: He isn't asking just from this map.

Mr. McPherson: No, your Honor.

The Court: He said from his geological and hydrological studies.

Mr. McPherson: I am asking, from the geological studies [7613] he has made, extending over a long period of years, and from the hydrologic studies he made, including the ground water, going back to 1921, and based on his educational background and the studies he made on this and other instances, whether he has an opinion, in effect, of the source of the underground-water supply in this region.

The Court: Between the San Joaquin on the north, the Kings River on the south, and Fresno Slough on the west——

Mr. McPherson: And the mountains on the east.

(Testimony of William I. Gardner.)

I am asking his opinion of the source of the underground water in this area.

Mr. Rowe: At what time? This time, 1952, or at what time?

The Court: It is indefinite as to the time.

Mr. McPherson: Today.

The Court: All right.

Mr. McPherson: We will go back day by day to the state of nature.

The Witness: I think that the sources of the ground water in the area between the San Joaquin River, Kings River, and from the mountains to the trough of the valley, are several in number.

There is contribution from the Kings River. There is Kings River water brought in by irrigation in the canals throughout the Fresno area. These canals bring in the Kings [7614] River water, which is spread out over the lands, and there is a considerable vertical seepage of this water down to the water table.

There is contribution from the small streams entering the area from the east, small streams draining the Sierra Nevada Mountains.

Q. (By Mr. McPherson): You are referring to——

A. Dog, Fancher, Big Dry Creek, and that group of streams.

There is contribution from the San Joaquin River in the bottom lands and in the area designated or limited, on the south, by the line, "G-G'" on Exhibit FF; and there is a minor, very minor, con-

(Testimony of William I. Gardner.)

tribution from precipitation. This would be, as I say, very minor under present conditions of cropping, although in the past it may have been greater than now.

There is some contribution in the sheet run-off, which also would be a very minor contribution.

The Court: What is the "sheet run-off"?

The Witness: The sheet run-off is the small rivulets and whatnot coming in from the hard rock area of the Sierra Nevada to the east; there would be precipitation there, and there would be a minor contribution to the ground water in that way. [7615]

The greatest contribution now is from the irrigation water, because it is spread out over wide areas, and it has the greatest cross-sectional area through which to seep downward. The area covered by irrigation water is much greater than the area covered by the streams, and it therefore offers the greatest opportunity for the downward seepage and replenishment of the ground-water supply.

Q. (By Mr. McPherson): Now, if we make the same question and direct your attention to the area in Madera north of the river, what are the major sources of the underground water supply as of today?

A. It is from the streams like the Fresno River and Cottonwood Creek. It is from sub-flow from the south. Starting in Fresno County south of the river at the crest of the ground-water ridge line labeled "Rg", there is a northwesterly flow to the

(Testimony of William I. Gardner.)

river and to the ground-water trough line in Madera County, and there is contribution from the San Joaquin River into the bottom lands; and where the slope of the water table is such that the slope continues downward to the northwest, there is a contribution from the San Joaquin River to the ground water in Madera County as far north as the ground-water trough line, which shows on Exhibit FF as the heavy dashed line north of the river.

There is also contribution from the San Joaquin River water which is brought into the area by reason of the diversion [7616] at Friant, and carried through the Madera Canal for irrigation out in the Madera area, and for ground-water recharge by release of the water down the channels, in the natural channels in the area. [7617]

Q. Is there any now, or has there ever been any contribution to the underground water table from any source westerly of the Fresno Slough into the area bounded by the descriptions heretofore given?

A. The evidence is to the contrary, that any movement of water from the west side of the valley would stop along the trough line. There would be —in the trough there is a generally northwesterly component of the flow because of the slope of the valley trough to the northwest, so that there would not be a contribution from the west side of the valley into the area that we have been discussing.

Another reason is that the source of supply on the

(Testimony of William I. Gardner.)

west side of the valley are infinitesimal compared to the sources of supply on the east side, because the eastern slope of the Coast Range is a very arid area, the stream run-off from the Coast Range is much smaller than the run-off from the east side, and we would not expect a flow of water then from the west side into the underground on the eastern side of the trough.

Q. Now, referring back for a moment to the movement, the direction of movement of the underground water table, I direct your attention to the closed contours at the lower right-hand portion of FF, into which you have drawn a number of arrows, not unlike the cone of depression shown by Mr. Lee on his Exhibit 77. Assuming that that cone of depression [7618] in the ground-water table exists at that point, and on the day this map was reflected, would the presence of such a cone affect, in your opinion, the general movement of the ground-water table, and by that I mean its course and direction?

A. That is a minor depression in the ground-water table brought about by pumping. There is a heavy draft in the area, and it does show a reversal of flow on the western side of the depression, but I believe that any effect at depth would disappear. That is purely a pumping effect, and——

The Court: Would it be different if it were in the spring, if there was pumping?

The Witness: In the spring that pumping low disappears to the point where we don't have the

(Testimony of William I. Gardner.)

closed contours running around it. It just represents a depression which is open.

The Court: All of your contours would be changed?

The Witness: Yes, there are modifications of it, certainly .

The Court: 10:00 o'clock tomorrow morning.

Mr. Rowe: May I ask—Mr. Bluhm is here—if I could take a look at his engineering notebook?

Also I would like to see that requested information.

Mr. Child: He can read it out loud.

Mr. McPherson: I suggest, since this is Mr. Bluhm's daily working diary, why can't he read the entries into the [7619] record?

The Court: Maybe he does not want to introduce it after he sees it.

Mr. McPherson: I want it introduced.

Mr. Rowe: I won't run off with his book.

Mr. McPherson: I want the dates inquired about introduced because I think they should be, after the character of attack made.

Mr. Rowe: All right, just read them.

Mr. McPherson: Pursuant to the request of Mr. Rowe, Mr. Bluhm has produced his daily diary, that is, the current one, which shows that, on March 13 and 14 of 1952, there is this entry:

"Ck. #18,024,473.

San Joaquin River—hydrograph for FID, Well—

(Testimony of William I. Gardner.)

1926—City of Fresno well data—talked with Gardner about exhibits."

And, incidentally, he made his income-tax return the next day, Mr. Rowe.

Where is this other entry?

Mr. Bluhm: March 19th.

Mr. McPherson: On March 19th following entry appears:

"S. J. River—complete map of spec. capacities of city, FID, Fresno College wells—memo. Went to City Hall to get corrected sheets (1945-1951) of [7620] city well data."

The Court: Is that all?

Mr. McPherson: Continuing on the next page, continuing the same entry of March 19th:

"Segel, City Engineer, said that well m.p.s. are tied to U.S.G.S. datum."

The Court: Well m.p.s.?

Mr. Bluhm: Measuring points.

The Court: Very well.

Mr. Rowe: I had on my desk a letter. Did I give it to the court—I don't think I did—from Mr. Peterson, giving the date of the raising of the dams.

The Court: I have not seen it.

Mr. Rowe: If anybody finds it or sees it, I would appreciate it, so I can turn it over to the court.

* * * * * [7621]

WILLIAM I. GARDNER

the witness on the stand at the time of adjournment, resumed the stand and testified further as follows:

Mr. McPherson: Yesterday reference was made in one of the court's questions to the position of the lines of equal elevation of the ground water table in the spring of 1951 before pumping commenced, and though it is a little out of the position we intended to offer it in, I at this time and in view of that question offer and ask be marked as next in number a map showing the lines of equal elevation of the ground water table as of March 1951 prepared under the direction of Mr. Gardner. Two copies have been handed to the [7629] clerk.

The Court: That will be GG.

(The document referred to was marked Defendants' Exhibit GG for identification.)

Direct Examination—(Continued)

The Witness: May I make that correction?

Mr. McPherson: Yes. Mr. Gardner has a correction he wishes to make.

The Court: That is lines of equal elevation in March 1951?

Mr. McPherson: Yes.

The Court: You have none for June?

The Witness: No, sir.

The Court: Very well.

The Witness: Could I correct a statement I made yesterday?

(Testimony of William I. Gardner.)

The Court: Yes.

The Witness: I noticed that in answer to a question as to when contribution from the river began to the south as would be shown by that line G-G on Exhibit FF, I said it began in '46 and '47.

Now the State ground water maps do not carry contours all the way to the trough in the early periods, but instead of '46-'47 it should be 1925, and the State map shows contribution—— [7630]

The Court: Where is that?

The Witness: That would be on page 7612.

Mr. McPherson: You mean the contribution was continuous from 1925 or intermittent?

The Witness: Apparently there were periods when there was not a contribution for an appreciable distance. It was variable.

The Court: You stated:

"A. To the best of my memory, it was in '46 or '47 that the contribution to the south began." It began in '24-'25?

The Witness: About '25. Prior to that the State contour, ground water contour maps, show a ridge extending about 7 miles west of Biola, and then the contours cease and they don't extend further than that.

The Court: You wish then to correct this testimony in the record?

The Witness: Yes, sir.

Mr. Rowe: I don't think the record should be corrected. That is what he said. If he changes his mind and he was mistaken on it, that is something

(Testimony of William I. Gardner.)

else, but I don't think we should amend the record now.

Mr. McPherson: I agree with Mr. Rowe. The witness refreshed his recollection by examining these maps overnight and concluded that his statement as previously made was in error, [7631] as I think the court would want him to do.

Q. Now, Mr. Gardner, I have marked the ground water contour maps for March of 1951, the original being now posted on the board.

Would you indicate the substantial changes, if any, between the contours as they appear in March of 1951 as compared with those shown on Exhibit FF which is for the fall of 1951?

A. On this Exhibit GG, as on Exhibit FF, we have indicated the movement of the ground water by the heavy arrows, and there is also indicated by heavy dashed lines the approximate position of the ground water trough north of the river in Madera County and south of the river in Fresno County starting from five or six miles west of Biola.

The ground water trough in Fresno County is approximately the same in the spring and the fall of the year.

The ground water ridge south of the San Joaquin River is still in existence and the movement of water is northwesterly from the ground water ridge into the river and into the ground water trough in Madera County.

There is a more southwesterly component of movement along the south side of the ridge because

(Testimony of William I. Gardner.)

the water levels south of the ridge have risen so that the ridge does not appear to be so sharp as it does on the October map.

Q. You mean it is higher or wider or what?

A. It is wider extending to the south because [7632] of the rise in water levels in the wells in the Fresno area westerly of Fresno.

Q. You don't mean the ridge is directioned in the south, it is just wider to the south, isn't that what you mean?

A. That is what I mean, that the water levels are rising in these wells south of the ridge so that the sharp crest of the ridge as it shows in the October map disappears and it widens in a southerly direction.

On the north side of the river the ground water trough line has moved downstream. In October of '51 it was shown starting along in Section 35, Township 11 South, Range 20 East, and then running in a west-southwesterly direction from that point.

In March of '51 the ground water trough is downstream and it is shown starting in Section 21 of Township 12 South, Range 20 East.

It then runs westerly very close to the river cutting across the uplands and then apparently coming right back to the bluff line in Section 25, Township 12 South, Range 19 East, and then continuing in a westerly direction through Township 12 South, Range 18 East, and 12 South, 17 East, Township 12 South, Range 16 East where it turns southwest-

(Testimony of William I. Gardner.)

erly into a ground water low which is about two miles north of the river. [7633]

There is a modification of the trough line in Madera County in Township 12 South, Range 17 East, comparing March with October, in that in this particular area of Township 12 South, Range 17 East the trough line is roughly a mile to the north where it was in——

Q. You mean a mile further to the north?

A. A mile further to the north than where it was in October of '51.

Q. How do you account for that?

A. Well, this fluctuation of the trough line is characteristic. It isn't a definite fixed line because it moves back and forth according to recharge and pumping. The trough is really a result of pumping on the ground water because prior to 1925 or '24 there wasn't a ground water trough here with subflow from the river northwesterly. The San Joaquin River throughout this area to a point west of Biola was a drainage stream and it wasn't until heavy pumping began and continued that the flow, the movement of ground water, was into the trough and since then the fluctuations of the line will vary from year to year and, as we see, from season to season on account of the pumping and of recharge from the various sources of ground water supply.

Q. Now you stated, I believe, yesterday in response to the court's question that there was a substantial difference [7634] in the contours that were reflected on Exhibit FF, October of 1951,

(Testimony of William I. Gardner.)

with the contours as they existed in the spring of that year which are now shown on Exhibit GG in the City of Fresno, or around the City of Fresno.

Would you point out the difference at that point?

A. Referring to Exhibit FF, there is shown in the City of Fresno a distinct depression in the ground water contours as shown by two of the contour lines, those for elevation 230 and for elevation 235, being closed. That is, they form a continuous closed line marking the central or deeper part of the ground water depression.

Now this depression is due to the heavy draft, the heavy pumping on the ground water and because such a depression is not the natural condition, the flow of ground water would have been along a plain sloping in a general west-southwesterly direction toward the trough of the valley, and it wasn't until this heavy pumping began that such a depression could be formed.

Now, then, in comparison we will point to the same area in the March of 1951 map and the closed contours have disappeared and instead of, you might say, there being a hole, a closed basin in the surface of the water table, there is now a small valley in the water table and slope of the bottom of this ground water valley which is out to the west-southwest, and we can see that it is starting to blend in with the general slope of the water table. [7635]

If we move westerly from the City of Fresno these various contour lines indicating the surface

(Testimony of William I. Gardner.)

of the water table are quite smooth, they don't have sharp kinks in them, and they are assuming what would be the shape of the water table if it were not affected by the heavy pumping.

I point again to the October of '51 map which shows the closed contour in the center—it is in the southeastern portion of the city, in which the streets run northwest-southeast and northeast-southwest. The closed contour there at elevation 230.

In that same general area on the March of '51 map the elevation would be marked along the south and eastern portion by the 245 contour.

In other words, the ground water has risen 15 feet in that particular area and the sharp depression has disappeared. [7636]

* * * * *

Q. (By Mr. McPherson): Mr. Gardner, are you familiar with the geological formations, including all of the depositions in the area of the Ancient alluvial cone of the San Joaquin River as defined by Mr. Lee? [7699]

A. Yes, sir, I am familiar with that area.

Q. Do you have an opinion as to whether in such a geological formation as that which comprises the Ancient alluvial cone of the San Joaquin River there are any aquifers, confined or semi-confined, that are capable of carrying water from the San Joaquin River in a direction contrary to and against the slope of the ground water table?

A. I don't know of any such aquifers.

Q. Could there be any such in such a formation

(Testimony of William I. Gardner.)

as that which comprises the Ancient alluvial cone of the San Joaquin River?

A. I believe that after a study of the geology of the area and of the well logs, that there is no such aquifer. I find no evidence for it either in the geology, in the ground water maps or in the studies of wells made particularly to see if there were two separate, independent bodies of ground water in the area, and it is my opinion that such a confined aquifer could not exist for more than, say, a mile.

I have stated before that in this area of the Ancient alluvial cone there are beds, such as clay beds, that could be matched up in the well logs for a distance of something like a mile, but there are no extensive confining beds which would extend for many miles through the cone. [7700]

* * * * *

Q. (By Mr. McPherson): By "that" you mean the cone line of Mr. Lee?

A. I am speaking of the cone line of Mr. Lee, here.

The Court: What about south?

The Witness: I think even in the south you could extend it farther, where it merges with the Kings River.

The Court: In other words, there is an overlap?

The Witness: An overlap.

Mr. Rowe: The court will notice he laid the ruler north of Fresno.

(Testimony of William I. Gardner.)

The Court: He laid the ruler generally on a line north of Fresno.

The Witness: I wouldn't restrict that line as representing anything at depth——

Mr. Goldberg: You said "that line"; you mean——

The Witness: ——any more than I would take this northern cone line. These major rivers had the major job of filling the valley, and that creeks, such as Red Bank, Fancher, Dog, Dry Creek, cannot keep up with the major streams, and the amount of fill, which——

(Reporter's note: Portion of record deleted by instructions of court at page 8233 of transcript.) [8055-56]

* * * * *

Mr. Rowe: There comes to my attention—we didn't mean to get into the files of the Government, and I guess Mr. J. E. Cobb assumed he was a taxpayer and had a right to look at the Government records—but anyway he found in his files probably one of the most interesting letters on the part of the Bureau to make a settlement after October 20, 1947 that I have seen. And I would like to have the record remain with the court, if there is no objection from counsel.

The Court: I do not know what you are talking about. What is it?

Mr. Rowe: Mr. Boke in this letter.

The Court: What is it you have there? Is that a letter?

Mr. Rowe: It is a letter from Mr. Boke, a copy of a letter.

The Court: Dated when and addressed to whom?

Mr. Rowe: Dated July 2, 1947, addressed [8456] to Mr. J. E. Cobb.

The Court: Is that the original letter?

Mr. Rowe: It is a copy in the Government's file.

Mr. McPherson: Where did you get it?

Mr. Rowe: Mr. Cobb, during the noon hour, was wondering what report they had on him. You left the records here, I presume for public inspection, for me. Anyway, Mr. Cobb took a look at it and in the letter, in the main part——

Mr. Child: Is this part of the plaintiffs' case?

Mr. Rowe: It is part of the case.

Mr. McPherson: Let me see it.

Mr. Abercrombie: Are you through with cross examination?

Mr. Rowe: I just didn't want the copy to get misplaced. I would like to have identified the whole file. In this, Mr. Boke states positively that after October 20, 1947 the Bureau of Reclamation would have no power whatsoever to enter into any contract on the San Joaquin River with anybody.

Mr. McPherson: He didn't say anything of the kind. Counsel's statement is preposterous on its face.

Mr. Rowe: All right. One of us needs glasses and you have them. Maybe I do, but I would like to show it to the court.

This line right here. (Indicating.) [8457]

Mr. McPherson: It is a conditional statement, your Honor. I think a like letter was written to someone else and has been offered in evidence.

The paragraph counsel refers to reads as follows:

"As you may know, it has been claimed by some that the taking of water rights occurred in the operation of the Friant Dam on or about October 2, 1940, and if that be true respecting your holding any claims which you have would be barred as a matter of law by October 20, '47 unless it is previously preserved by the execution of a contract or by the institution of litigation. If it is not so preserved the United States will be powerless to contract for any adjustment after that date. If a contract is to be executed therefore sufficient time should be allowed in advance of October 20, '47 within which to secure title information to perform the work required in securing the execution of the contract."

The Court: Is it one of the letters that was in this box of documents?

Mr. Rowe: It is a slightly different form.

The Court: Was it in the box that was produced this morning?

Mr. Rowe: Yes. [8458]

The Court: Very well. Do you want it marked for identification?

Mr. Rowe: Yes.

The Court: Very well. Mark it for identification.

Mr. Rowe: I think the court will recall Mr. Bennett's statement of when it commenced.

The Court: This will be Plaintiffs' Exhibit 176 for identification. It is a letter dated what date?

Mr. Rowe: Dated July 2, 1947.

The Court: Very well.

(The document referred to was marked Plaintiffs' Exhibit No. 176 for identification.)

* * * * *

The Court: There is no question pending.

Mr. McPherson: I move to strike the statement of counsel. [8826A]

* * * * *

IRVIN M. INGERSON

the witness on the stand at the time of adjournment, resumed the stand and testified further as follows: [8847]

* * * * *

Cross Examination—(Continued)

Q. (By Mr. Rowe): Mr. Ingerson, just briefly would you state your engineering experience. I believe you graduated from U. C., did you not?

A. Correct.

Q. And after that, what did you do?

A. This is briefly, now, Mr. Rowe?

Q. Yes, briefly, year by year.

A. Since graduating from the University of California in 1924 I have worked for the State Division of Water Resources, starting with its predecessor the State Division of Water Rights and have been continuously employed by those agencies or one agency and then the other.

(Testimony of Irvin M. Ingerson.)

The Court: Since 1924?

The Witness: Right. [8848]

* * * * *

Q. At no time since 1924 did you ever design any dam on a major river or major channel of a river, have you?

A. You said "at no time." The answer is I have designed, in the course of duty I have designed dams. I have designed dams in excess of a hundred feet for estimation purposes. I have designed dams 50, 60, 70 feet high that was actually constructed, and I have designed many scores of dams of the character and size as proposed by the Bureau.

* * * * *

Q. Now let's just start with one dam that you designed yourself, the location and the year. [8849]

* * * * *

The Witness: I said that in the course of my duty I had designed a dam which was constructed by the South Fork Pitt River Irrigation District, and since you ask further in question I will go in finer detail and say that the design that was proposed by the Division of Water Resources was practically accepted and the final refinement of detail of design was made by the engineer of the irrigation district.

The Court: What was the name of the irrigation district?

The Witness: As I remember it, it was South Fork Pitt River Irrigation District.

The Court: And where was the dam built?

(Testimony of Irvin M. Ingerson.)

The Witness: On West Valley Creek.

The Court: And where is that in the State of California?

The Witness: It is in Modoc County, located approximately bee-line about four or five miles east of the town of Likely, which town is located approximately 15 to 18 miles south of the town of Alturas in Modoc County in the northeastern corner of the State of California.

The Court: And how big was the dam? [8851]

The Witness: As I remember, it was around 60 to 70 feet high from the stream bed, and it was an earth-filled dam.

Q. (By Mr. Rowe): Who was the engineer for the district at that time?

A. Now dead, the man was Sam Mounshen, and the consultant engineers on that dam were Chester Marliave and—the name has escaped me; he is well-known in California — I can't remember the other man.

Q. And as I understand you — and if I am wrong, correct me—you designed that dam while working for the State of California for the irrigation district?

A. If you ask me that kind of a question you are trying to pin me down to the design of the dam as it now exists in every detail and part. I have attempted——

Q. I am most assuredly trying to pin you down so we understand each other on that.

Do I understand you correctly that while an

(Testimony of Irvin M. Ingerson.)

employee of the Division of Water Resources you designed this dam for this South Fork Pitt River Irrigation District?

A. The dam as now built—— [8852]

* * * * *

Q. On the dam design.

A. Mr. Rowe, the design of a dam is a set-up in the California Code, and the actual design of the dam is the design made by the person who is responsible for its construction.

Q. And that was Chester Marliaves, wasn't it?

A. I believe that is right, and Sam Mounshen.

Q. And was not you? [8853]

A. Correct. It was not me.

Q. Now, since you didn't design that dam, give me one you did.

* * * * *

The Witness: Mounshen was the engineer of the district. [8854]

Q. (By Mr. Rowe): What year was that?

The Court: And Chester Marliaves is the man whose name was on the plan?

The Witness: I can't—I don't know, your Honor. I mean, I can't remember that.

Q. (By Mr. Rowe): What year was that in?

A. That the dam was constructed,——

Q. Yes.

A. ——or I made the proposal?

Q. What year was it designed, and what year was it constructed?

A. It went through a process from—about 1930

(Testimony of Irvin M. Ingerson.)

and '31 was the proposition made by the Division of Water Resources, and the dam was designed through about 1931, '32, and, as I remember, it was constructed about 1934 and 1935.

Q. So I am clear on this, you were not an employee at any time of the South Fork Pitt River Irrigation District, on any feature of the design or construction of this dam?

A. Correct. I was not an employee at any time of the South Fork Pitt River Irrigation District.

Q. All right. Now, what was your official position with the Bureau of Water Resources of the State of California—the division of Water [8855] Resources—from 1931 to '35? How did you show on the payroll?

A. Well, it was either assistant or associate hydraulic engineer. I disremember which.

Q. And do the hydraulic engineers of the Division of Water Resources do dam designing or dam testing, or is there somebody else that does that? Is there a special division, and was there a special division in 1931 to 1935?

A. The Division of Water Resources makes many studies, estimates, plans and designs of dams.

The Court: No, I think you better keep to the question.

Read the question.

(Question read.)

Mr. McPherson: A compound question, your Honor.

The Court: It is two questions.

(Testimony of Irvin M. Ingerson.)

Q. (By Mr. Rowe): Was there any division in the Division of Water Resources, from 1931 to 1935, for passing on the safety features of the dams? And, if so, what was its name?

A. Do I answer this last question as if the first one was gone?

The Court: As if the first one was gone.

The Witness: Yes, there is a section in the Division.

The Court: Was there at that time?

The Witness: The section was started, as I remember, in 1931. [8856]

The Court: And what did they call it?

The Witness: It is the section having to do with supervision of the safety of dams.

The Court: And what do they call it? Has it a name?

The Witness: Well, it is directly under the State engineer, through an assistant State engineer, and has to do with the codified duties of the State engineer in connection with the safety of dams.

Q. (By Mr. Rowe): Who was in charge of that division at that time?

A. It was not a division. It was a section.

Q. Who was in charge of the section?

A. As I stated, the State engineer was responsible, and the head of the section is an assistant State engineer, and his title would be——

The Court: His name at that time is what he wants.

(Testimony of Irvin M. Ingerson.)

The Witness: I can't remember. I can identify the man, but I can't remember his name. He being dead many years now, I have forgotten the name, your Honor.

The Court: Well, who is in charge now?

The Witness: William or Bill—William Holmes, H-o-l-m-e-s.

The Court: And he has been for how long?

The Witness: Since approximately, oh, about 1940, '41 or '40. [8857]

Q. (By Mr. Rowe): And it is your testimony that the Division of Water Resources designed this dam for the district, and then passed on it themselves?

A. It is not. That is not my testimony. I said the Division of Water Resources proposed the design for the dam, in accordance with the investigation as shown in Bulletin 41 of the State Division of Water Resources; and I said that the District Engineer designed the dam as it is built.

Q. So the District Engineer designed the dam?

A. Right.

Q. Now, what dam did you design—— [8858]

* * * * *

Q. And your name is on there as the designer?

A. My name is on there? I didn't say that.

Q. Is it on any part of this design?

A. So far as the final design, I am sure my name was not on it.

The Court: No, he means upon those that are in the files of the Division.

(Testimony of Irvin M. Ingerson.)

The Witness: Correct. In the files of the Dam Department, as we call it, or Dam Section of our Division, those plans do [8859] not contain my name, I am sure.

Q. (By Mr. Rowe): But they contain somebody else's name, do they not?

A. Obviously.

The Court: Whose, Marliaves'?

The Witness: Yes, and Sam Mounshen's, the engineers that had designed the plan according to the code and presented the plan to the Division of Water Resources, that is, the Dam Section, or the section for safety of dams, and so forth.

* * * * *

Q. (By Mr. Rowe): Turning to the other dams, what set of plans in the Division of Water Resources of the State of California, on a dam design, bears your signature as being the engineer in charge, or even has your initials on it? Are there any such things?

A. As far as I know, to answer your question directly, there are none. There may be, but as far as I know, there are none. [8860]

Q. What district, private utility or any other person or organization outside of the Division of Water Resources did you draw plans of any dam that has your name on it?

A. The type of dams that were constructed along the line, so far as I know, no plans were drawn except perhaps on a blackboard. [8862]

* * * * *

(Testimony of Irvin M. Ingerson.)

Mr. McPherson: That was not the question as I understood it.

Mr. Rowe: Not plans for the Division of Water Resources but plans for some irrigation district, private utility or any other private person or corporation.

The Court: That was the question.

Mr. Abercrombie: And not in any way for the Division of Water Resources?

The Court: The question was clear.

Mr. Abercrombie: I don't think it is.

The Court: It was clear and the witness answered it.

Mr. Abercrombie: I didn't hear his answer.

Mr. McPherson: What was his answer? [8863]

The Witness: I have not answered the question. I am ready to answer the question.

The Court: Will you read the previous answer, the last previous question and answer that was answered.

(The record referred to was read by the reporter as follows:

("Q. What district, private utility or any other person or organization outside of the Division of Water Resources did you draw plans of any dam that has your name on it?

("A. The type of dams that were constructed along the line, so far as I know, no plans were drawn except perhaps on a blackboard.

(Testimony of Irvin M. Ingerson.)

("Q. And that was the extent of your activities in dam design, you drew some plans on a blackboard?")

The Court: That is, for other than in the course of his duties as engineer for the State of California?

Mr. Rowe: Yes.

The Court: That is the question. The objections are overruled.

The Witness: To answer that question I start with your Honor's statement that that is outside of my duties with the Division of Water Resources.

The Court: What I mean to say is outside of whatever plans you drew that you talk about here in connection with [8863A] your activities in the State of California.

The Witness: That is right. It has been in connection with my activities with the Division of Water Resources and help and assist the water users along the stream and water-master service areas, and as such I have suggested — repeating more or less—I had to suggest and perhaps sketch plans and designs for improvements, repair and construction of check dams of the character perhaps like has been proposed by Mr. Hill.

Q. (By Mr. Rowe): On a blackboard?

A. I didn't say that.

Q. Well, let's start all over again.

What dams did you design, not on a blackboard but with pen and ink and paper, for any irrigation

(Testimony of Irvin M. Ingerson.)

district, public utility or private person or corporation since 1924?

A. Well, let's cut out the public utilities. I have not done any work for public utilities except for the South Fork Irrigation District, the Hot Springs Valley Irrigation District, which was part of these watermaster service areas. I can't say whether or not I helped the district or whether I helped the individual within the district so I can't answer that question.

But we get down to the point of the individual and it is the farmer along the river. If you want the farmers' names [8863B] along the river that owned the dam that they, the farmer, or he, the farmer, constructed that is a pretty good stretch of my memory. I could name some people if you care to go up and see them about that.

Q. Name some farmer and the location of the dam that you made the design for in pen and ink.

A. I didn't use pen and ink on my design that I know of.

* * * * *

Q. Did you ever design them on the sand of these various streams?

Mr. Child: That is highly argumentative.

The Witness: Yes, I have also designed them on the sand, Mr. Rowe.

Mr. Rowe: I thought so.

The Witness: I am trying to answer your specific question.

Mr. Rowe: Yes. [8864]

(Testimony of Irvin M. Ingerson.)

The Witness: Okay.

Mr. Rowe: Now we are getting some specific instances.

Q. What dams on what streams did you design with your finger in the sand, and for whom?

A. My particular habit is that probably the 5 or 10 or 15 dams that were built up there, probably part of the plans were on the sands alongside the dam as in the course of construction.

The Court: He wants to know the names of them, Mr. Ingerson, and the location and the name of the owner. [8865]

* * * * *

The Court: Then how did you design the dam, did you make a plan like you have attached here to the State's plans?

Mr. Rowe: He said he made none in pen and ink.

The Court: Pen and ink, stylus, pencil, wax pencil — everybody knows what we are talking about. [8866]

* * * * *

Q. (By Mr. Rowe): I want to go back to the sand. What dams did you design with your finger in the sand or, as I understood you——

The Court: He has answered that. He said he probably did not, that in connection with it he probably drew some sketches in the sand or something like that.

The Witness: Right.

Q. (By Mr. Rowe): If you didn't design any for the Bureau that bears your signature by those

(Testimony of Irvin M. Ingerson.)

in the sand, what dam did you design on a blackboard?

A. I don't remember.

Q. Now did you use any other method in conveying your thought to these various people outside of writing in the sand and the blackboard?

A. Yes, I used my hands.

Q. What do you mean by that, like a Frenchman, you go like this (illustrating), build something like this (illustrating), [8867] or just how did you use your hands?

A. Just like you did right then when you were explaining it to me.

Q. Now what dams did you design by using your hands like a Frenchman?

A. I don't remember. [8868]

* * * * *

The Witness: May I comment further on your design, your Honor?

The Court: It isn't my design. It is from your testimony.

The Witness: Okay. May I comment on that exhibit: I would make that point, inasmuch as I described this dam, I would say in my conception of the word and the meaning of "design," I designed the dam, and your Honor prepared the plan.

The Court: Oh.

The Witness: Therefore, I am in the position of the designer in this case. Now, I didn't use any pencil or paper to do it. [8889]

* * * * *

(Testimony of Irvin M. Ingerson.)

Q. (By Mr. Rowe): Who did you design that Bieber Dam for?

A. Well, there were a group of people who received water through a diversion point immediately above the dam, and in that day—I don't know who owns it now—in that day there were a series of names, of which there was a man named Ernie Babcock, Mrs. Gerig, G-e-r-i-g,—I don't remember any more of them.

Q. And how far from the town of Bieber, on the Pitt River?

A. I guess it is within the city limits, if the town has limits.

Q. And you had charge of the design of that dam?

A. I didn't say that. I said I assisted in the preparation of the ideas of the construction of the factors in this dam, that is, the physical works of the dam. That happened to be a repair job, that particular one.

Q. That was a repair job?

A. That is right.

Q. Then you didn't design that dam?

A. In my interpretation of the word "design," I designed some of the features in connection with this repair. [8892]

* * * * *

Q. (By Mr. Rowe): As I understand it then, this was an oral design of a dam, is that right? You just made suggestions?

A. I don't know.

(Testimony of Irvin M. Ingerson.)

Q. You don't remember?

A. I don't understand your question.

Q. Well, I mean you just made suggestions orally?

A. That is what I said, I made suggestions.

Q. Orally? A. Yes. [8894]

* * * * *

Q. Now what other new dam did you design, have actual charge of a design?

A. This is limited now to new dams?

Q. Yes. [8895]

* * * * *

A. * * * Well, there is one man's name that was Ralph Oyler, near Lookout.

* * * * *

Q. And you had charge of the design of that?

A. The owner had charge of the design. The owner had charge of the dam. It was his dam. I made suggestions as to its physical components.

Q. Now can you give any other dam that you actually designed or had charge of the design, new dam, in California on any river?

A. As I understand the question, I have to be in charge of the design? [8896]

Q. Yes. If you don't know, say so. That is my last question.

A. I don't think I had charge of the design in any dam in the State of California.

Mr. Rowe: Then I submit the witness is not qualified. [8897]

* * * * *

IRVIN M. INGERSON

called as a witness by and on behalf of the intervenor State of California, having been previously duly sworn, was examined and testified as follows:

* * * * *

Direct Examination

Q. (By Mr. Goldberg): Mr. Ingerson, you are a civil engineer, aren't you? A. Yes.

Q. Licensed in the State of California?

A. Yes. [9603]

* * * * *

Q. (By Mr. Goldberg): Now since your graduation from the University of California you have been employed by the State Division of Water Resources, haven't you?

A. Yes, sir, since 1924. [9605]

* * * * *

A. I acted as water master for the Division in various areas in the northeastern corner of the State. That assignment lasted for about five [9614] years.

* * * * *

Q. (By Mr. Goldberg): Now how long were you engaged in this watermaster work?

A. Well, that lasted about five years until 1936.

* * * * *

A. * * * And what I did on those studies included preparation and drawing of ground water maps, which I have previously testified [9673] are those maps included in Exhibit 73, I think it is, Mr. Goldberg.

Q. The valley-wide map?

(Testimony of Irvin M. Ingerson.)

A. Valley-wide ground water map.

Mr. Goldberg: That is Exhibit 73. [9674]

* * * * *

Q. Who had charge of the general work, the field work referred to in Reports 10, 11 and 12, you or Mr. Van Etten?

A. Mr. Van Etten had immediately until he left in '38.

The Court: When did he leave in '38, at the end of the investigation?

The Witness: No, sir. Mr. Van Etten left, as I remember, about Christmas time or a little after. The exact date I don't remember.

The Court: In '38?

The Witness: Yes, in '38; between '37 and '38, leaving me in charge of the works.

The Court: For the year '38?

The Witness: Right. [9685]

The Court: Overruled. The question is whether or not he wrote the reports.

The Witness: Well, that is an embarrassing question because, in fact, I wrote the draft of the report, that is, the physical writing of it, but——

The Court: You dictated it?

The Witness: Yes.

Mr. Rowe: Don't be embarrassed, Mr. Ingerson. Don't be immodest. [9696]

* * * * *

The Court: They are your language except for the editing that you spoke of?

(Testimony of Irvin M. Ingerson.)

The Witness: I will have to admit to that, your Honor, yes. [9697]

* * * * *

The Court: No, Mr. Ingerson. I understood you to say that you wrote the report and that there was some editing. From your answer I take it that the editing was only of language. The essence of the report is not necessarily the language, the essence of the report is the ideas that are expressed and the conclusions that are there.

Now my question of you is this: Are the ideas and conclusions expressed in those three reports still basically the ones which you expressed when you first prepared the reports before they were edited?

The Witness: Yes, your Honor. [9701]

* * * * *

The Court: Mr. Ingerson, here is the 1938 map. That is within the period of time which you said you had something—I have not quite understood your previous answer—I understood you to say that you prepared the maps from which the plates were made.

The Witness: Yes, your Honor.

The Court: Now let us take just this one map, 1938. Who was responsible for the decision where to put these lines?

The Witness: I myself. [9736]

The Court: You?

The Witness: Yes.

(Testimony of Irvin M. Ingerson.)

The Court: Now is that true of the other maps between 1936 and 1944?

The Witness: To the best of my recollection, that is correct, your Honor.

The Court: That is you yourself?

The Witness: Yes, and the reason why——

The Court: And you decided which wells to take into consideration to connect certain contour lines?

The Witness: I considered all wells.

The Court: I know, but I mean it was your decision, for instance, where to put the 250 foot contour line?

The Witness: Yes, your Honor. [9737]

* * * * *

Q. (By Mr. Rowe): Did the court ask you that question, and did you give the answer, the question being:

"Who is the man responsible for making the choice?

"The Witness: It is the man I mentioned yesterday that is now dead, namely, Mr. Sawtelle. He was Senior Delineator, and has had the experience, over many years, of drawing these contour maps and putting information on them from which he draws the contours."

Was that question asked by the court, and did you make that answer?

A. Please continue with the next paragraph.

Mr. Rowe: No, answer the question.

The Court: I think I am responsible for that.

(Testimony of Irvin M. Ingerson.)

If I am mistaken in my rulings, counsel have an appropriate remedy to take care of it. As long as I am judge, I am going to continue to run the court.

The Witness: I beg your pardon, your Honor. I didn't mean to—— That question refers to——

The Court: No, answer "Yes" or "No."

Mr. Rowe: "Yes" or "No."

Mr. Goldberg: Just answer "Yes" or "No," did you make the statement. [9747]

The Witness: Yes, I made the statement. [9748]

* * * * *

Q. (By Mr. Rowe): As I understand you, Mr. Ingerson, Mr. Sawtelle was the one that drew the maps in Plaintiffs' Exhibit 73, that whole series?

A. He did the drafting of them, yes.

Q. And he did the drafting of all these maps in Reports 10, 11 and 12, didn't he?

A. Well, he supervised the drafting. Whether the man directly under him or he did the line work, I disremember.

Q. Well, both Waddell and Jones supervised your activities in regard to Reports 10, 11 and 12?

Mr. Goldberg: Asked and answered.

The Witness: Yes, and Mr. Edmonston and Mr. Hyatt. [9751]

* * * * *

Mr. Rowe: Your simile reminds me that I have heard some corporals say that they really ran things instead of General Eisenhower. That is what I am getting at.

(Testimony of Irvin M. Ingerson.)

The Court: The question, as I remember it is, how many men took part in the process of the preparation of the plates in Reports 10, 11 and 12. The same number, approximately, each plate?

The Witness: No, your Honor. Because after one plate was done the same men, same group, may pick up another one. But I would say overall that there were probably five people involved in the preparation.

The Court: On the three reports?

The Witness: Yes, your Honor.

Q. (By Mr. Rowe): How many people were involved in the dictating of the three reports?

The Court: Dictating the text?

Mr. Rowe: Dictating the text.

Q. How many people worked on that?

Mr. Goldberg: This is dictation exclusive of transcription of the dictation? [9755]

Mr. Rowe: Yes.

The Witness: Oh, three. That is of course the dictation of the preparation of the drafts. That doesn't include checking and reviewing. [9756]

* * * * *

The Court: Mr. Ingerson, just a moment.

Who was responsible, who was the responsible supervising hydraulic engineer, Waddell and Jones or Waddell or Jones or neither of them or one of them or both?

The Witness: Mr. Jones, acting in the capacity of supervising——

The Court: I do not care how he was acting.

(Testimony of Irvin M. Ingerson.)

Was he the supervising hydraulic engineer, whether he was called that or not?

The Witness: Yes.

The Court: Very well.

Q. (By Mr. Rowe): On Reports 10, 11 and 12?

* * * * *

The Court: I understand it to be the position of the State that the water from the Kings River flows into the San Joaquin.

Mr. Goldberg: Correct.

The Witness: Correct.

The Court: But the water from the Kings gets over all these ridges but the water from the San Joaquin cannot get over any of them?

The Witness: No, your Honor, I didn't say that. I beg your pardon. [9846]

The Court: You said it cannot get over the ridge underground.

The Witness: That is correct.

Mr. Goldberg: That is correct, underground.

Q. Mr. Ingerson, how does——

The Court: Let Mr. Ingerson explain it to me. I just told him what I could not understand about it. [9847]

Mr. Abercrombie: Go ahead.

Mr. Goldberg: Now, can you explain to the court what the court does not understand?

Mr. Rowe: I object to that. It is obvious the court does understand, and the witness can't explain.

(Testimony of Irvin M. Ingerson.)

The Court: I don't know, that is undertaking a very large order.

Mr. Goldberg: My question is limited to the area bounded on the west by Fresno Slough, etc.

The Witness: In answer to his Honor's question, the statement that Kings River water goes into the San Joaquin River is based solely and primarily upon the fact that water is transferred by way of surface ditches, for purposes of irrigation, from the Kings River through the surface canals of the Fresno Irrigation District, and that water which flows through those canals in part percolates from the bed of that canal into the ground water table underneath the canal, or is spread through lateral farm ditches out over the large expanse of irrigated land, and some of which percolates from the irrigated areas down toward the ground water.

Therefore, that water which reaches the ground water, the slope of which is toward the San Joaquin River in the area north of Fresno, which comes from irrigation served by water from the Kings River, flows northwesterly perpendicular to the ground water contours on the north side of that ridge, into or toward and into the San Joaquin River. [9848]

Therefore, Kings River water by way of surface diversion and transportation, and through the medium of irrigation of those lands lying north of the crown or crest of the ground water ridge which lies north of Fresno and south of the San Joaquin River, reaches the underground north of that crest

(Testimony of Irvin M. Ingerson.)

and hence, by matters controlled by the law of gravity, goes into the channel of the San Joaquin River or passes under the channel of the San Joaquin River, and continues its way northwesterly into and under the ground water basin underlying the lands in Madera County.

Mr. McPherson: Does that answer your question, your Honor?

The Court: No.

Mr. McPherson: Well, I conceive it our duty to answer your question if we can.

The Court: No, it doesn't answer my question.

Mr. McPherson: In what way?

The Court: It partially answers it.

I understand you to limit your statement to that it is transportation of the water taken from the Kings River and onto this ridge (indicating)?

The Witness: Yes.

The Court: Which flows into the San Joaquin?

Mr. Rowe: The ridge indicated by the court was——

The Court: Enterprise Canal. [9849]

The Witness: Enterprise Canal and Herndon Canal.

The Court: Yes. Then I do not understand you to mean that any of the water taken from the Kings and put into these intervening canals finds its way into the San Joaquin River?

The Witness: I don't see that it can. This model indicates it doesn't.

The Court: You heard Professor Gardner's testi-

(Testimony of Irvin M. Ingerson.)

mony concerning the fan of the Kings and the San Joaquin?

Mr. Rowe: Dr. Gardner never delineated the fan, your Honor.

The Court: Well, you heard his testimony concerning it?

The Witness: Yes.

The Court: Did you understand his testimony to be that the underground water of the Kings seeped underneath here (indicating), clear to the City of Fresno, and at one time the Kings River flowed down through the City of Fresno?

The Witness: Yes.

The Court: That in his opinion it was underground water from the Kings that went clear north to the City of Fresno?

The Witness: Yes.

The Court: You do not agree with him?

The Witness: Yes, I do.

Mr. Abercrombie: In other words, this is the confusion: This is a 1950 map, and those contours change from year to year. [9850]

Mr. Goldberg: Dr. Gardner's testimony, I understand, was a discussion of it as it was in the state of nature.

Mr. Rowe: And you already proved that in the state of nature, by your OO, that the Kings River never went near Fresno.

The Court: You, in your opinion, think water from the Kings River will never seep underground

(Testimony of Irvin M. Ingerson.)

over the ridge that is formed by this canal that we delineated a while ago, whatever the name is?

Mr. Rowe: That is Fowler Switch; is that the one you mean?

The Court: Do I understand your opinion correctly?

The Witness: The point——

The Court: Wherever the Kings River flows, it will not flow over that ridge?

The Witness: The point you are making is that it does not?

The Court: It does not.

The Witness: That is right.

The Court: But up here at 480, it flows down here (indicating), comes off there and comes down this way (indicating)?

The Witness: I haven't any 480. I have a 400.

The Court: That is right, 400. [9851]

The Witness: The water which leaves the river at the 400 contour cannot reach Fresno; but the water which leaves the river by virtue of and along these channels in which the Gould Canal and, I think it is called, the Fresno Canal, head, which is north of the Kings River—and I am pointing to the top layer of the map, these red ditches—those channels through which those ditches flow divert Kings River water through those channels, and—I haven't been asked to follow a drop of water from that point. But any drop of water starting at the 400-foot contour, which comes from the Kings River, at the intersection of any of these

(Testimony of Irvin M. Ingerson.)

red lines, from the 400-foot contour, that drop of water comes down this way (indicating). You will notice it is north of the ridge, and it follows our gradient and goes directly to the hole under the City of Fresno.

The Court: Why are there any ridges if the water always follows along the lowest course? Why should that drop of water follow the low course, and these (indicating) go along a ridge?

The Witness: Because they follow the course of gravity, which means they follow the steepest course from where they are to where they go.

The Court: And this steepest slope would be here (indicating)?

The Witness: Yes. [9852]

* * * * *

The Witness: Yes, your Honor.

Now, ridges must of necessity be made because there are troughs. If there were no troughs there would be no ridges. Some place there is a trough line and a divide, and water from beyond the trough line cannot pass the trough line in any instance and cross over and rise against the slope of the water table and against the force of gravity, and cross over and come over this ridge, through the ridge or under the ridge.

The Court: So long as the ridge is there?

The Witness: So long as the ridge is there, yes, your Honor.

Well, it just can't, because water goes downhill, which is the law of gravity.

(Testimony of Irvin M. Ingerson.)

The Court: If you have a confined aquifer there, or pressure?

The Witness: Then we are not dealing with ground water tables.

The Court: All right.

The Witness: That is another matter.

The Court: Very well.

The Witness: I am dealing with a free water table, your Honor. [9897]

* * * * *

Mr. Rowe: Before going on to that question, counsel, I would like to ask you, did the witness refer to a ridge as a part in the hair, a team of horses, a drainage ditch between two sources or a hole in the ground? I never got it quite [9904] clear.

* * * * *

The Court: Do you think there are any confined aquifers [9917] between the Sierra Nevada Mountains and the Coast Range, in this valley out here, in this area we are describing?

The Witness: Not to do that.

The Court: Any place, do you think there are any confined aquifers down below Gravelly Ford, westward?

The Witness: They would not be that kind of aquifer. The answer is no, there would be no such confined aquifers in the vicinity of Mendota or in the——

The Court: In the area between the San Joaquin and the Kings?

(Testimony of Irvin M. Ingerson.)

The Witness: There would be none.

The Court: How do you account for the artesian wells that used to exist?

The Witness: Where, your Honor?

Mr. Goldberg: Let's get out the Hall maps, the Ham Hall maps show an artesian well somewhere.

The Court: Yes, the Ham Hall maps.

Q. (By Mr. Goldberg): I am referring to Exhibit L, Defendants' L. [9918]

* * * * *

The Court: Let me see, you are still explaining the difference between saturated soil and wet soil?

The Witness: Yes. I am trying to get the saturation away from it so we can start all over.

The Court: Let us not start all over. Once is enough.

Mr. Goldberg: I didn't hear the court. [9926]

* * * * *

Q. (By Mr. Goldberg): Now, Mr. Ingerson, again with reference to Cal. V, can you indicate on Cal. V the sources of ground water for the City of Fresno? A. Yes.

Q. Will you please do so?

A. Exhibit V indicates the sources of ground water on the basis of, as I say, criteria that I have described this morning as to the differences between divides and ridges and troughs and those definitions thereof. The sources of ground water therefore to the City of Fresno——

The Court: As indicated by Exhibit V?

(Testimony of Irvin M. Ingerson.)

The Witness: Yes, your Honor, as depicted by Exhibit V, are two in number. [9927]

First, the stream flow from the minor tributaries, including Dog, Dry—that is Big Dry Creek—Fancher Creek and the intermediate runoff from the slopes of the foothills across the eastern edge of the valley floor toward the City of Fresno. That water moves underground in accordance with the slopes of the contours as shown on Exhibit V toward the City of Fresno, not all of it but some of it, and that some of it can be defined by the criteria as to the line or divides between the directions of movement. Some of that water goes into the San Joaquin and it is a large source of water toward the San Joaquin westward between Pinedale and upstream to Friant.

Now the second source of water to Fresno is water which is brought into the area, that is imported water from the Kings River——

Mr. Rowe: That is, surface——

The Witness: This water brought in on the surface is distributed on the lands completely surrounding the City of Fresno as irrigation water of agricultural lands, crops, and there is therefore available around the rim of the cone of depression in the City of Fresno water derived solely from the Kings River through these ditches.

And those two sources are the only sources of ground water being extracted by the heavy pumping by the City of Fresno which creates this cone

(Testimony of Irvin M Ingerson.)

of depression and this [9928] overdraft under the City of Fresno.

The demarcation of the water coming from Kings River, inasmuch as that supplies all around the cone cannot be determined, if it supplies all of the ridges surrounding the cone of depression but the water from these other streams, Dog, Dry and Fancher can be shown, demonstrated, by the criteria of the divide of the drop, locus of the drop, furthest removed that can come, will show that the northeast portion of the cone of depression in the City of Fresno is supplied by water from Dry Creek and Dog Creek and that the northeast portion extends from the east edge of the cone of depression, the easterly edge, northwesterly around to and including the area underlying the location of Highway 99 and the Southern Pacific main line railroad.

And that area, that is, the perimeter of the cone, involves nearly five-eighths of the perimeter and it is a direct contributor to the City of Fresno as water is pumped from the underground for municipal supplies.

As shown on Exhibit V there was one point in the source, and that is that the city has depressed the cone of depression so deeply so as to actually reverse the direction of movement of the water table west of the city and southwest of the city, so that the water actually moves northeasterly from the southwest corner of the city limits toward more

(Testimony of Irvin M. Ingerson.)

or less the center of town, to aid and supplement these heavy pumping drafts by the city. [9929]

Q. (By Mr. Goldberg): Now, how do you know from this model that the city has pumped so extensively so as to reverse the direction of the ground water movement? I take it you are referring to the fact that on this 245-foot contour there has been what you have described as a coving back— —

A. Yes.

Q. Toward the northeast.

A. Yes. And if the constricting ridges, as they might be called, which encircle this cone of depression, are fully pictured, the small hole or a hole cut out in the contour, the 235 contour, which extends down through the 230 contour under the City of Fresno shows that there is a reverse gradient from the bottom of the hole upward toward the west. That is in converse downward toward the northeast. And since the gradient of the water table is toward the northeast, by the law of gravitation water must be flowing toward the northeast.

Mr. McPherson: At that point?

The Witness: At that point, yes, the southwest corner of the City of Fresno.

Q. (By Mr. Goldberg): Now, had this draft not occurred to reverse the ground water gradient, what would the contour have looked like? [9930]

A. Well, as shown in other ground water maps, there would be a less degree of relief, that is the hole would not have been as relatively deep. There would have been less convolutions in the contours,

(Testimony of Irvin M. Ingerson.)

and the steepness of the cone of depression would have been less. That is, the slope of the depression would have been less, indicating that there would be less draft.

Q. Now, going to the area northeast of the City of Fresno, can you determine the sources—from this diagram can you determine the sources of ground water replenishment, say in the area Clovis to Pinedale? A. Yes.

Q. And what are those sources?

A. Th. predominant source indicated by V is that of Dry Creek.

Mr. Rowe: Which Dry Creek?

The Witness: The Big Dry Creek; the big source indicated by the contours on V is Dry Creek, it being the outstanding, most important promitory on the ground water slope, and the general slope of that ground water table from the northeast toward the southwest, with the City of Fresno being the termination of that slope, shows to me that above the Enterprise Canal the ground water slope is practically or comparatively similar to the ground water slope below the Enterprise Canal. Therefore it would indicate to me that the [9931] Enterprise Canal is not a major source of ground water replenishment in the area northeast of Clovis.

However, as we move down the slope, in the vicinity south of Clovis and Clovis there is a swelling, as it were, of the ground water plane, indicated by the contours on Exhibit V, and that swelling is coincident with the fact that overlying the

(Testimony of Irvin M. Ingerson.)

swelling are canals of the Gould Canal system, and which lead from south of Clovis toward Pinedale. Obviously, then, to me, this swelling is the result of the combined sources, not only Dry Creek, Dog Creek, and Fancher Creek, but that supply is amplified by losses from the Gould Canal system; and the knowledge that I have—I mean, my observation of the irrigation around Clovis, the extensive irrigation and spreading of water in the City of Clovis has added to the contribution or the amounts contributed to the ground water under and south of the City of Clovis.

Q. (By Mr. Goldberg): Now, there is another phenomenon indicated on this map, which I am going to describe: Between the Fowler Switch Canal and the Kingsburg Canal, the diagram indicates a ridge, doesn't it? A. Yes.

Q. And the apex or highest point of that ridge is not under either of the canals, the Kingsburg or Fowler Switch; the apex is between the two canals?

Mr. Rowe: I object to that as leading. [9932]

The Court: Overruled; preliminary.

Mr. Rowe: I don't think it is. The witness said there were two sources for Fresno, period. He can't back up now—that is in the record. He is all through as far as Fresno is concerned. He has no right to go back. The record shows he said surface water through irrigation ditches, D. Creek and Dog Creek. Counsel, after argument here, is trying to coach the witness.

The Court: Objection overruled. Counsel's state-

(Testimony of Irvin M. Ingerson.)

ment to this point is preliminary, and he hasn't got to the question yet.

Mr. Goldberg: That is right. The question is about to be put.

Q. How is this phenomenon to be explained?

A. You are pointing to the area lying between the Fowler Switch Canal and the Centerville and Kingsburg Canal, which is an entirely different area than we have been talking about.

Q. [illegible] is right.

A. The evidence or, should I say, swelling of the contours between these two——

The Court: The ridge that exists there?

The Witness: Yes, the ridge.

The Court: What causes the ridge? That is his question. [9933]

Q. (By Mr. Goldberg): Why is the ridge between the canals, instead of under the canals?

A. It is because more water is available for percolation from the surface between the canals than it is in the canals, because the canal is 20, 30, 40 feet wide, each of those canals, approximately, plus or minus, and the area in this vicinity is irrigated from those canals, and the area of land which is flooded, which is the same as the area of a canal which is flooded, is so many more times greater than the area of the ditch itself—it is thousands of times greater, that is, the wetted area of the ditch as compared with the wetted areas of these score of square miles of irrigated land—that the actual amount of water that can be contributed

(Testimony of Irvin M. Ingerson.)

to the ground water is a function of the area upon which water is applied.

And in the area around Del Rey, there are relatively heavy irrigations, and the ditch falls under where the maximum amount of water is applied to the surface. In this case, therefore,——

Mr. McPherson: You said "the ditch." You mean the ridge?

The Witness: The ridge is what I meant to say, yes.

And in this case, a ridge is formed by the major canals. We must not forget that the switch canal and the Kingsburg Canal [9934] are simply the main canals indicated on the diagram, on the legend, and there are numerous laterals, sublaterals and farm ditches; so that the network of irrigation application is extensive and intensive in the intervening area.

Q. (By Mr. Goldberg): Can you indicate this same condition, of a ridge existing between two more or less parallel canals, indicated elsewhere on the diagram or, I should say, model?

A. It is difficult to show this, because in the Fresno Irrigation District we have put in more of the canals than were put in in the—or there were and are more canals shown than in the Consolidated. Therefore, if we had only put the main canals, like Herndon Canal, Gould Canal, and Dry Creek Canal, which would be comparable to the number of canals in Consolidated, we would have found that condition. But in the Fresno Irrigation

(Testimony of Irvin M. Ingerson.)

District, we have attempted to amplify, with a red line, all the canals shown on the 1950 ground water map, Exhibit 80 and 167.

Q. Mr. Ingerson, calling your attention to the Herndon Canal, I think it is, and either the Big or Little Sandridge,——

A. Yes. Well, in this instance we do not have the ridge so positively shown between the canals. In converse, we have a trough line between the two canals, and the trough between the two canals has a completely converse answer, and the answer is converse to what I said here, that is, those canals [9935] as indicated by their name, namely, "Sandridge," those canals lie on soil which is so sandy and so permeable as to provide immediate and very rapid percolation from the canal into and to the water table, to the saturated zone.

Secondly, those canals, which are distributaries of the Herndon Canal, west of Biola—it is indicated on the model, the name "Herndon," and the two canals, 1½ miles south and 2 miles south, namely, Little Sandridge and the Sandridge Canal —are canals which help to distribute water through a longer period of the year than some of the other canals of the Fresno Irrigation District, because Herndon Canal is the main canal which serves to protect the City of Fresno from the flood waters coming down Dry Creek.

In other words, Dry Creek water is conveyed westerly through the Herndon canal system, and all wintertime, in normal years, when there is flow

(Testimony of Irvin M. Ingerson.)

in Dry Creek, normally is to be found flow in the Herndon Canal, while other canals in the Fresno Irrigation District may be dry. Therefore, the longer time through the year run of the Herndon Canal, it has a tendency to build up this ground water ridge. [9936]

* * * * *

The Court: Do you have the information on the perforations on all of the wells which are shown on this Exhibit 167, the 1950 water contour map which lie above the 150 foot contour, "above" meaning easterly of the 150 foot contour line?

The Witness: No, we do not have information as to the perforations on all of the wells. [9961]

The Court: Did you take into consideration the perforations in the wells that you do have that information on in drawing these contour lines?

The Witness: No, we did not take the perforations into consideration. [9962]

* * * * *

Mr. Rowe: I ask the court's pardon, but you heard the testimony of the chief counsel that Mr. Smith's ground water contour lines were correct, which shows that Tranquillity, if that is so, is fed by the San Joaquin. [10,014]

* * * * *

The Witness: Well, it is the trough. It is the line of the furthest possible influence of the river.

The Court: Is it a ridge or trough?

The Witness: Both.

The Court: It is both a ridge and a trough?

(Testimony of Irvin M. Ingerson.)

The Witness: Right. Because, your Honor—may I make an explanation? I know it sounds completely ridiculous.

The Court: Yes, it does, it sounds ridiculous in view of your testimony here for a couple of weeks. [10,100]

The Witness: But engineeringwise the fact is this: Remember w. alk about a dividing line between sources. That is the thing we must put on here, is the dividing line between sources.

The Court: What divides, the ridge or the trough?

The Witness: Both, as I would illustrate. [10,101]

* * * * *

Mr. Rowe: I submit to the court, so the record will be helpful in future years, that the witness indicated a movement, again, parallel to the ground water contour, for water from the San Joaquin River. When he uses a pointer, I think that should be in the record.

Q. (By Mr. Goldberg): Now, Mr. Ingerson, take a crayon and draw on there the path of the water you indicated. [10,130]

The Witness: The statement by Mr. Rowe is false.

Mr. Goldberg: Just draw on there the path of the water, as you indicated it.

Mr. Rowe: I submit that is where the ruler just went, parallel to the contours; and I will ask a statement by the court as to whether that is true.

The Court: Yes, the ruler went in that direc-

tion. It may have been inadvertent, I don't know.

* * * * *

The Court: Very well. Now you have indicated that on the map, how the water leaves the river and flows onto the ridge and down the ridge?

The Witness: Yes, your Honor. [10,135]

* * * * *

The Witness: Well,——

The Court: In other words, the 250 line on the Kings River, to the 250 well in Township 16 South, 21 East, then to the 250 well in 15 South, 21 East, and to the well in Fresno: How did you smooth that out?

The Witness: Well, your Honor, then I will have to go further to explain how I would smooth it out, then.

The Court: How did you smooth it out?

The Witness: By relation to the surface as it was finally developed, I mean of these various other contours. There [10,268] are other controls, for instance, the control of the line—well, as I was going to explain, as I build out these contours as they go each direction, I develop trough lines and ridge lines which are developed, and I try to mold into those lines—I mean I try to mold the contours into those lines to be as smoothly as possible, to represent the conditions of the smooth and uniform undulated plane. I am anticipating——

The Court: That is on the 250 contour?

The Witness: Yes. As I say, the 250, the curvature, the roundness of the 250 was determined by

(Testimony of Irvin M. Ingerson.)

its relation finally—as it was finally moved over; and it is like a painting or any sort of work that has to be molded or blended, with one color here and one color there, one shape here. It is a blending process which comes into the consideration of the art of drawing ground water contours or ground surface contours. That process is an art, your Honor, and as such there are people that are adept —is that the right word?—that are good at doing this sort of thing, which I don't claim myself to be amongst the top, but having had some experience with it, I appreciate the problem, and I appreciate the art and—what will I say—the trick in [10,269] doing it.

* * * * *

The Court: What is your definition of a component of flow?

The Witness: If any object, article, person, mass, automobile, horse and cow——

Mr. Rowe: Corporation?

The Witness: No, not a corporation—is moving from one point to another and if it is considered that the direction of movement can be plotted——

The Court: Can be what?

The Witness: Plotted.

The Court: Yes.

The Witness: ——on a map, then by virtue of the fact [10,327] that we have a map we must have orientation of that map, namely, north and south and east and west.

Now if that direction of movement happened to

(Testimony of Irvin M. Ingerson.)

be in a southwest direction, then there are two components with respect to the map, one component is the movement of that person. [10,328]

* * * * *

Q. Just to see if I understand you correctly, [10,332] Mr. Ingerson, it is your testimony that the condition described by the court could not persist in the state of nature, even though it might at one time exist?

A. Correct, I agree that is right. It could not survive as it was. You make the assumption, and the assumption is dispelled——

The Court: If I understand your answer correctly, the water in the well at Biola would flow into the river farther down the river.

The Witness: I said it would have to, and I said because of the fact——

The Court: Not "because"; I just want to know what you said: that it would flow into the river farther down the river?

The Witness: Yes, but that wasn't my total answer. The answer was, yes, it would go into the river.

The Court: I think I understand your explanations better than I understand your answers.

* * * * *

The Court: I of course would like to see the answers shortened. I would like to see the answers shortened of all witnesses and if the witness can, and I hope that he will, make his answers as brief as possible, it will help.

(Testimony of Irvin M. Ingerson.)

I realize, however, that it is his brain, it is his mind, I cannot climb into it and grind the answers out any shorter or any faster, and he has the privilege and the right of course to express himself, and his opinion. [10,340]

* * * * *

Q. (By Mr. Goldberg): Now, Mr. Ingerson, you have told us several times during the course of your examination on the ground water contour maps, both in response to my questions and in response to the court's questions, that you considered the [10,480] water table in the area which we have been discussing, you considered the water table to be a free water table.

Now for what reasons do you consider that to be a free water table?

A. My reasons are based upon my experience in the hydrologic characteristics of the problem of the supply, changes and the drafts upon the water table adjacent to the San Joaquin River. And replying first upon those hydrologic aspects of the questions and problems, I will attempt to outline the picture as I see it, indicating that the ground water table in the vicinity of Fresno and as far west as—well, to a line which may be said to extend as far as Kerman—and that line extending northwest to southeast through Kerman parallel to the topographic trough of the valley, which at the same time is more or less parallel to the line of the foothills.

First, in observing or rather looking at the rec-

(Testimony of Irvin M. Ingerson.)

ords of wells which I have access to which have been collected by the State through the period of these past more than 30 years, I have observed that there is a striking continuity in the rising and falling of the water levels in those wells which in itself indicates that the whole body of the water table is rising and falling more or less in the same direction except of course there are conditions which are easily explained as to differences in that statement where [10,481] additional and unusual supplies are made available over an area of a matter of ready determination, or there has been known to have occurred an unusual draft in a certain area.

But even with those in consideration it is apparent to me that this great broad plain of water, which is not a pure p-l-a-n-e, it is a p-l-a-i-n of water, which has undulations, rises and falls in a sort of undulating fashion depending upon the relations between the total water supply available and the disposal of the water by irrigation demands through pumping.

That in itself to me is sufficient to indicate that conditions other than a free water table could not exist.

That general undulation which I have previously used as an example, the large sheet of cloth or a sheet which would be tied in the corners but which could undulate up and down as one plane, depending upon the forces that might be exerted upon it at various places, those forces being draft to depress it and to try to add to it; the continuity of

(Testimony of Irvin M. Ingerson.)

the water table determined by these wells has been relatively uniform.

As an example to the contrary I point out the area west of this line that I described a few moments ago lying west of Kerman and about the topographic trough of the valley. It has been pointed out that the ground water contours in some of the maps of recent years presented in Exhibit 73, and series, that the contours have not been drawn but that the [10,482] elevations of the wells have been put on the maps instead, in lieu of—well, I shouldn't say in lieu of—but the elevations have been put on there and no contours drawn.

As I remember, I pointed out that the discontinuity between the water levels in very close and adjacent wells is so severe as to demonstrate that the water table in that area is not a so-called free water table.

If this condition did exist, if the wells east of this line through Kerman, or west of Kerman someplace, then there would have been, hydrologically speaking, a serious consideration given to the possibility that the water table was not free. [10,483]

That on the face of it, an experienced hydrologist comes to the conclusion it is a free water table, without having to go into detail of the various other things. Nevertheless, at this moment there are other factors that may be stated, which would indicate a free water table.

Considering the relative permeability of the soils, relative with respect to the area northeast of

(Testimony of Irvin M. Ingerson.)

Fresno lying over what the geologists call the Older Alluvium, which consists of tighter, well-weathered or long-weathered materials, and those soils lying west and southwest of Fresno are more Recent Alluvium, having better permeability—I said, now, considering the relative permeabilities of these materials, there has not been developed in any of these areas a persistent outstanding condition of change or discontinuity of the water table that has been persisted, despite conditions of supply and demand being uniform in the area. That if there is a persistence of a difference in water table elevation, that persistence has been coincident with a change in the use pattern in the area.

As an example of that statement, I point out the extreme cavitation or so-called hole in the ground water table under the City of Fresno. Here it is known that some 50,000 acre-feet a year is extracted from a relatively small area, and, that, in consequence, this unusually high, intense extraction has created a continued change—or continued unusual trough [10,484] or hole in the ground water table.

Therefore, the fact that there is at this point a decided difference in the water table levels under the City of Fresno, with relation to the rest of it, is so easily explained in the fact of the unusual extraction.

Therefore, because it has persisted that way, and because of the necessity that water be supplied to the hole so that these extractions may be continued for the benefit of the City, it is obvious, from the

(Testimony of Irvin M. Ingerson.)

water table map, that that supply is directly from the surrounding water table around the rim or around and beyond the rim; that the entire water table, therefore, as evidenced by the water table in the various wells of observation, has been and is and will contribute directly to this excessive draft by the City of Fresno.

Now, there are also—I have taken, as corroborative, evidence which is not hydrologic but which, as I read, as the court has read, as is presented in this case, is geologic evidence—of which I have had for many years the information at hand—namely the geologic reports contained in Report 11 of the Water Project Authority, which is in evidence in this case, the information which was based upon the study of the geology of the surrounding country, which said that there was not any definite confining barriers; that there was not any reason why the water table could not act independent [10,485] of the geologic formations of the valley fill.

That to me is purely corroborative of my first statement as to why it was a free water table, namely, the hydrologic aspects, in answer to this problem that it is a free water table.

Mr. Rowe: At this time I would like to move the last statement of the witness, that any of the State reports hold that is a free water table with no confining barriers, be stricken. That is not a fact, and it is not so stated.

If Mr. Ingerson says, "I rely on Mr. Gardner as the basis for that," that would be all right; but I

(Testimony of Irvin M. Ingerson.)

ask that the statement he makes as coming from reports 11 and 12, which are in evidence, and assuming something not in evidence,——

The Court: That part may be stricken, because they speak for themselves.

Mr. Goldberg: I think the witness is entitled to state how he read Reports 11 and 12, and how he used them in arriving at his opinion.

Mr. Rowe: Let him point out where they say there is no confining barrier.

Mr. Goldberg: You can get that on cross examination. Also, the witness did not say there was no confining barrier.

The Court: Go ahead.

Have you finished your statement, Mr. Ingerson?

The Witness: Well, I hoped what I have said would be sufficient [10,486] material that the court could understand my thinking of the matter, as to why this is a free water table.

The Court: All right.

The Witness: I can go on at various lengths and say this: Observation of the wells in this area shows definitely that during the course of heavy pumping in the vicinity of said well, or in many of the wells, or pumping of the well itself, that the water table adjacent to the well sinks a great—at lower depths in a severe mound, and that in the course of time, that is, in the course of a few days or in the course of a few weeks, as would be indicated by measurements of the water table in the well, that those water tables, as the seasons progress or the months

(Testimony of Irvin M. Ingerson.)

progress through the seasons, that the water table has a tendency, as shown by these records, to seek more or less a uniform undulating plane, and to heal over, as it were, the local effect of the drawing down of the water table by the extraction from the well. If that be the case, then that shows that the water table is connected.

It would be like suddenly drawing a bucket of water out of a pond, although the pond, of course, has no soil in it, and there can be a quick response; but if I can ask the court to imagine the very short period of time, and expand it as far as the ground water is concerned: You take a bucket of water out of a pond, immediately you create a hole, and immediately all of the entire pond moves in to fill the void, and a slight [10,487] amount of lowering of the pond results.

That happens exactly, only in slow motion, in the water table. If water is taken out at a point, a cavitation is created; but, because of the friction of these waters through these soils, as I have mentioned at the rate of about one mile a year, it may be necessary, in the course sometimes of many years, if a hole like in the City of Fresno is developed, for that hole to finally be filled by the inflows from the body of water.

For instance, if the hole is three miles in diameter, the radius would be a mile and a half, and I would come to a general conclusion that I would not be surprised if that hole would require a year and a half or two years—because the records are every

(Testimony of Irvin M. Ingerson.)

two years, to prove it—that it would take probably two years for that hole to heal over.

Time in this matter is relative, and the time is relative because of the permeability of the material through which our water body moves.

Mr. Rowe: I ask that that whole answer be stricken as not responsive. In other words, this is an expert witness. If you put a witness on the stand, as I understand it, an expert witness, he states some facts and you ask the witness to draw his conclusions. But to put the witness on the stand and have him jump from free water to the rate of percolation — I think there ought to be some response to the question [10,488] counsel asked.

The Court: You didn't object to the question. The question was why he thought there was a free water table.

If you admit a question "Why" on direct, he can say he believed there was a free water table because Marc Anthony went to see Cleopatra one time, and the Nile was rising and falling. That might be his reason.

Mr. Rowe: If he would stay within logical reasons, I might not object.

The Court: Motion denied.

The Witness: There is one last point in this matter of the free water table, that is, of supply.

This area, like all the rest of the areas of the valley, is subjected to the seasons of the year, as to water supply. We have a dry season and a wet season; and the only supply to the water table is, of

(Testimony of Irvin M. Ingerson.)

course, naturally, rainfall and runoff from the streams, and those occur, as we all know, generally in the so-called spring season of the year, and in the fall season of the year the flows are small.

Now, the water table rising and falling, therefore, must be in close correlation with the stream flow; and since all stream flows in the valley operate —since they flow at practically the same time, the correlation between stream flow of the rivers themselves—that is, flow in the rivers themselves—and the water table is purely a coincidence. [10,489]

For instance, the water table in the area that we are speaking of, around Fresno, has been lowering during such previous years that there has been low run-off in the San Joaquin and in the Kings. The peculiar sort of thing is we could correlate the free water table fluctuations in the vicinity of Fresno with the run-off of the Pit River in Modoc County. They both would correlate beautifully, because——

The Court: The water in the City of Fresno would correlate with the run-off of the Pit River in Modoc County?

The Witness: I don't doubt it. The point is, there is correlation with things coincident outside the entire area. The correlation with the season, and any attempt to correlate the run-off of adjacent streams seasonably with that of a water table, just because the total season of the stream nearby is small, the water which is in this particular respect is not a safe correlation.

For instance, the run-off of the Kings River and

(Testimony of Irvin M. Ingerson.)

the run-off of the San Joaquin River are commensurate, that is, they measure the same; so if you correlate one with the other, they are that way, and the water table rises and falls somewhat in accordance with the water supply to the area. [10,490]

The Court: I do not quite understand that. Maybe I misunderstood you.

I understood you to say that you could correlate the water table of the city of Fresno from the run-off of the Pit River.

The Witness: I didn't say "city," I said the water table in the vicinity of, let us say, the Fresno plains.

The Court: Very well. The Fresno plains.

The Witness: Yes.

But you cannot correlate it for the runoff of the Kings River and the San Joaquin.

The Witness: I didn't say that, your Honor. If I said that, it was not quite what I meant.

I meant to say that the correlation with the local streams would give you the same correlation because it is coincident. I thought I prefaced my statement that the streams of California run off strong in the spring.

The Court: Yes, you did.

The Witness: Therefore any stream that runs off in the spring——

The Court: Very well. You have explained it and straightened it out.

The Witness: Okay.

Mr. Rowe: I don't think he straightened it out.

(Testimony of Irvin M. Ingerson.)

The Court: He straightened out my misunderstanding that [10,491] he could relate it with the Pit River and he could not with the Fresno and the Kings, and he said he did not mean to say that.

Mr. Rowe: To correlate it with the Pit River up in Modoc County is what he said, and if you gave him enough time he would correlate it with the Mississippi.

The Witness: I didn't say the Mississippi.

The Court: There may be some relation.

The Witness: Yes.

Q. (By Mr. Goldberg): I suppose the same thing that makes the Mississippi run full makes the Pit run full.

A. Certainly. It is those things, and they cannot be assigned as being the point of correlation. Any attempt to point out that a correlation exists between a stream flow and a water table as in this particular instance as the one and only correlation that can be made, is not a safe engineering statement.

Therefore, as I first said, in my water supply idea that the water table responds to the season with respect to the precipitation or, as I said first, nature's rainfall, and that because the water table rises and falls in part with respect to this overall water supply afforded to the area to replenish it, indicates to me that the water table is wholly responsive to that condition and is therefore like [10,492] a lake. It responds to the inflow to it uniformly and wide-

(Testimony of Irvin M. Ingerson.)

spread through the area of the Fresno plains between the two streams.

Q. If I may put a question, Mr. Ingerson, while you are on this subject, the fact that the flows in the surface streams in the area of the Fresno plains are high and that the water table is high—let's assume that fact—does that indicate that the water table is high because the streams are high or does it indicate that both are high because of some independent factor, say such as precipitation?

A. That is correct.

Q. What is correct? Which is it, is it one or the other?

A. The paramêter in this correlation is the precipitation.

The Court: The what?

The Witness: The parameter.

Q. (By Mr. Goldberg): You say "parameter." Is that p-a-r-a-m-e-t-e-r? A. Correct.

Q. What does that mean?

A. Well, that is the factor which is common to two variables.

Mr. Minton: What are the two variables?

Q. (By Mr. Goldberg): What are the variables?

A. The variables is the change in the ground water table and the change in the stream flow.

Q. And the common factor?

A. Is precipitation.

Q. Now have you completed your statement of reasons as to why you consider the ground water

(Testimony of Irvin M. Ingerson.)

table in the area of the Fresno plains a free ground water table? A. Yes, at this time.

Mr. Rowe: I suggest that the court might instruct the witness that there is a time for everything, and at this time I am going to object to the fact that he is not through now.

The Court: Of course you might ask him that on cross examination and it might give him some ideas.

The Witness: That is what I had in mind.

Mr. Rowe: That is what I am afraid of.

The Witness: I was waiting for it.

The Court: Proceed.

Q. (By Mr. Goldberg): Mr. Ingerson, you refer to areas on the ground water contour maps where you have measured wells but no contours are drawn. Now I notice that such areas seem to first appear on the '49 map, Exhibit 73-A. Will you describe the areas for the record? [10,494]

A. (Examining exhibit.)

Q. You are now looking at Cal. W, the 1951 map?

A. Yes. There are many ground water elevations indicated by observation wells on the 1951 map lying along the topographic trough of the valley through the Tranquillity and James Irrigation Districts and both west, north and south of that area.

The same is true of the 1950 map in the same area.

1949.

In '48 the contours were drawn within the limits

(Testimony of Irvin M. Ingerson.)

of the wells but there are not any well locations given outside of the contours drawn.

Q. And the contours do not extend down into the area — I am referring to the '48 map, Exhibit 73-B-1—the contours do not extend down into the area where you now show wells measured but contours do not appear?

A. That is correct. By "now" meaning in the present year.

Q. '51 map? A. That is correct.

Mr. Rowe: How about '47? Are you going through all of them?

Mr. Goldberg: No, I didn't intend to take him back through all of them. They started apparently in '48 or '49 putting the well measurements on but not drawing the contours [10,495] in the area he has described.

Mr. Rowe: I think it started in '47, if I am not mistaken, just from memory.

Q. (By Mr. Goldberg): Now, Mr. Ingerson, the court called your attention yesterday——

Mr. Rowe: The court will notice—not to interrupt—on Plaintiffs' Exhibit 73-C that they did start in '47 and those were used by both Professor Smith and Mr. Lee to show the flow underground.

Mr. Goldberg: Just a moment.

The Court: It occurred where, the contours where? What are you talking about?

Mr. Goldberg: I don't know what Mr. Rowe is talking about. He said they did start in '47.

(Testimony of Irvin M. Ingerson.)

Mr. Rowe: The contours. You said they started after '48.

Mr. Goldberg: They started after '48 in putting on notes of well measurements but not during contours in the area to the west of—well, it includes most of Tranquillity and west of Tranquillity.

Mr. Rowe: I understood the question to be the contours.

Mr. Goldberg: No, they had contours——

The Court: It is clear.

Mr. Goldberg: Very well. [10,496]

The Court: Where is Exhibit V? What happened to it?

Mr. Goldberg: Exhibit V?

The Court: Yes.

The Witness: The model? It is right here, your Honor.

The Court: Very well. I want to look at it after a while.

Q. (By Mr. Goldberg): Now, yesterday, Mr. Ingerson, the court called your attention to a mound occurring in Township 16, South, Range 19 East—I don't know the section numbers—the elevation of the mound in 1951 as shown by Cal. W about 185 feet and in 1950 as shown by Exhibit 167 it was about 190 feet as shown by a well measurement within the mound.

What, if anything, is the significance of the rising and lowering of that mound in determining whether there is a free ground water table in the general area of the mound?

(Testimony of Irvin M. Ingerson.)

A. Well, that is, as I intended to explain a little while ago, that the mound is surrounded by a circular trough, as it were, if it could be understood in my meaning——

Mr. Rowe: I want to object to that as having been asked and answered.

The Court: Yes, it was yesterday.

Mr. Rowe: It certainly was.

The Court: Yes, at length. [10,497]

Q. (By Mr. Goldberg): Suppose that instead of having a free water table in the vicinity of the mound, the mound itself had been an independent water table, either perched or — well, such as a perched water table—how would the behavior of the mound have been affected?

A. It would not have fallen at the same rate as the surrounding water table. [10,498]

* * * * *

Recross Examination * * * * *

Q. (By Mr. Rowe): How much do you recommend to be had from the outside at the present time, and how much to be pumped, from a good engineering standpoint?

A. Mr. Rowe, I am basing my remembrance on what Mr. Segel said as to quantities, and that was last year, and we have to think of the future and the growth of the city, and my thought is at least two-thirds of the total requirements that the city could anticipate in the future should be derived [12,788] from outside. [12,789]

* * * * *

ROBERT T. BEAN

recalled as a witness by and on behalf of the defendants, having been previously duly sworn, was examined and testified as follows:

* * * * *

Direct Examination * * * * *

Q. (By Mr. Goldberg): Where did you receive your training in geology?

A. My training in geology was at three different institutions: [12,800] First the University of Michigan, when I went to summer school at the University of Michigan in 1939.

I entered Ohio State University in '40 to 1942, and at Stanford 1946-47. [12,801]

* * * * *

Q. (By Mr. Goldberg): What was your subject of specialty at college?

A. My major was mathematics, but I took a number of science courses in addition.

Q. And after you graduated from Wooster College, did you have further scientific training prior to your study of geology? A. Yes.

Q. What was that?

A. I practiced — it wasn't exactly training. It was work in a scientific field, in that I taught school, in which the studies I taught were mathematics and science. That was 1938-39.

Q. And did you instruct in geology?

A. No, except as geology came into the general science course. [12,802]

* * * * *

(Testimony of Robert T. Bean.)

A. In 1942, I began work with the U. S. Forest Service, and worked in geological work—in fact, the work was ground water geology, geology of underground water—at the San Dimas Experimental Station in Southern California, where I worked out the geology of the experimental forest area in the San Gabriel Mountains. [12,803]

* * * * *

Q. (By Mr. Goldberg): Now, after you concluded your work with the U. S. Forest Service, you also worked for the U. S. Geological Service?

A. Yes. [12,804]

Q. And will you describe what work that included?

A. That work was in the ground water division of the United States Geological Service, with headquarters in Albuquerque, New Mexico. And the job involved the study of the Roswell artesian basin in the vicinity of Roswell, New Mexico. [12,805]

Q. Study to determine what?

A. The actual object of the study was to determine what would happen to water which was put into a reservoir which had been constructed many years before by the Bureau of Reclamation. This reservoir leaked and therefore was not satisfactory for a storage reservoir but it was under consideration to use it as a flood control reservoir.

The question was, where does that water go if it leaks out of the reservoir, and that was the object of my study, and I believe it was carried through successfully as to where that water went.

(Testimony of Robert T. Bean.)

Q. What was the name of the reservoir?

A. The Hondo reservoir.

Q. And you say it was built by the Bureau of Reclamation. Is it a Bureau of Reclamation project?

The Court: That is immaterial.

Q. (By Mr. Goldberg): Where is this Hondo reservoir?

A. It is on the Hondo River which goes through Roswell, New Mexico. [12,806]

* * * * *

Q. (By Mr. Goldberg): Now how long have you been working for the State Division of Water Resources, Mr. Bean?

A. Just over five years.

Q. That is, you stated work in 1947?

A. Yes. [12,807]

* * * * *

The Witness: Yes, but only two of those was I a student, the other I was on the faculty.

The Court: Doing something in the field work?

The Witness: That is correct. [12,827]

* * * * *

The Court: You were asked the extent of the relatively permeable clay east of the Corcoran clay, which takes off over there in about the vicinity of the Gravelly Ford Canal intersection with the river.

Then you asked what is the surface elevation of Gravelly Ford Canal.

Mr. Goldberg: Mr. Rowe asked that, sir.

(Testimony of Robert T. Bean.)

Mr. Rowe: No, I didn't. I said I recalled Mr. Gardner said 185.

The Court: The witness asked what the elevation was. [12879] You have the map there now.

Q. (By Mr. Goldberg): What is the elevation?

A. It is in the vicinity of the 200-foot, at least on the bluffs. Down in the river it is about 195 feet.

My answer is, I believe there is a shallower confining bed which extends eastward from Gravelly Ford approximately to the elevation 225, and so that would be a little bit off this quadrangle here, the Gravelly Ford Quadrangle.

Q. Let's see, the next one from the Gravelly Ford quadrangle to the east is—— A. Biola.

(Witness secures the quadrangle referred to.)

The Witness: Here is 225 (indicating).

Q. (By Mr. Goldberg): That 225 is at a point some place between the town of Biola and the head of the Gravelly Ford Canal?

A. Yes, sir, very close to Skaggs Bridge.

Q. All right. Now, east of this relatively shallow confining layer, in your opinion what is the greatest extent of the relatively impermeable material?

A. I believe immediately east of the point we have just spoken of there may be fairly extensive relatively impermeable materials of perhaps as much as two miles, as an estimate, in length.

Farther east, say east in the vicinity of Herndon, they are probably not over one mile in extent.

(Testimony of Robert T. Bean.)

Q. Taking all the area east of Highway 99 and up to Friant, Mr. Bean, what is the greatest extent of the bed of relatively impermeable material in that area, in your opinion?

The Court: From where to where?

Mr. Goldberg: Between Highway 99 and Friant, sir.

The Witness: I believe that there are probably not any more extensive than approximately one mile in diameter.

The Court: One mile in diameter?

The Witness: Yes.

Q. (By Mr. Goldberg): Now, you testified that in the area somewhat to the west of Highway 99, that there may have been beds as large as two miles.

Do the beds tend to become relatively smaller as you go eastward?

A. Yes, the extent of the beds does tend to become relatively smaller.

Q. Does that apply to all of the area now south of the San Joaquin River and north of the Kings River? A. Yes.

Mr. Goldberg: May I have Plaintiffs' Exhibit 62?

(Exhibit handed to counsel.)

Q. (By Mr. Goldberg): Mr. Bean, I am going to show you [12,881] Plaintiffs' Exhibit 62,——

The Court: Hold it up.

Mr. Goldberg: This is a map on which Mr. Lee spotted various wells, and on which he also drew his thoughts as to the cone lines of the San Joaquin.

(Testimony of Robert T. Bean.)

The Court: Oh, yes, I remember it.

Mr. Goldberg: He has a legend on here, area I, Modern Alluvial Cone of the San Joaquin;

Area II, Ancient Alluvial Cone;

Area III, Dry Creek; and

Area IV, Alluvial Cones, Dog, Redbank, and Fancher Creeks.

Q. Calling your attention now to the southernmost line, which is the south line of Area IV or the south line of the alluvial cone of Dog, Redbank, and Fancher Creeks, as indicated by Mr. Lee on Plaintiffs' Exhibit 62, you will note it is tending to get closer and closer to the south line of the alluvial cone of Dry Creek, as shown by Mr. Lee?

A. Yes.

Q. Does that indicate one ephemeral stream in the process of obliterating or merging with the cone of another stream?

Mr. Rowe: I object to that as leading. If Mr. Goldberg wants to testify as a geologist, I have no objection. I will admit he is qualified. [12,882]

The Court: Overruled.

He has two questions there, however.

Mr. Rowe: He is putting words in the witness' mouth.

Mr. Goldberg: No, I haven't.

The Court: You have two questions there, obliterating or merging. Which is it?

Mr. Goldberg: First let's take obliterating,—excuse me, first let's take merging.

(Testimony of Robert T. Bean.)

The Court: What does that indicate, if anything, to you geologically?

The Witness: It certainly indicates that the two cones, the two so-called cones,——

Mr. Rowe: No, it is "cones" in the record.

The Court: Go ahead.

The Witness: ——are tending to merge. It shows a lot else, too.

Q. (By Mr. Goldberg): What else does it show?

A. It shows that even according to Mr. Lee, the alluvial cones of Dog, Redbank and Fancher Creeks run together in Area No. IV. He made no attempt to differentiate them; and it is my opinion that the cones cannot be differentiated anywhere on this exhibit in actuality, with the exception of differentiating the more modern deposits of the San Joaquin, in Area I, from the area which is now in part covered by depositions [12,883] of the small streams, such as Little Dry, Redbank and Dog, and underlying which are always deposits——

Mr. McPherson: You mean Big Dry Creek?

The Witness: Big Dry Creek, yes, sir. I must have misspoken.

Q. (By Mr. Goldberg): What I am interested in, Mr. Bean, is the way this Area IV is shown to be getting smaller and smaller, as far as Mr. Lee has drawn it.

The Court: I think he explained that. He said it illustrated the merging.

Mr. Goldberg: That is what I expected him to say, but I didn't hear it. If he said that,——

(Testimony of Robert T. Bean.)

The Witness: I believe I said it.

Mr. Goldberg: Very well.

The Court: In other words, it illustrates the merging not only of Dog, Fancher and Redbank, but the tendency of the San Joaquin cone—or the Kings River cone south of that to merge with No. IV?

The Witness: Yes, sir; and also Big Dry and the deposits of the San Joaquin River.

Q. (By Mr. Goldberg): And if this merger were to continue during a period of time,—assuming for the purposes of the question that the cones are distinguishable now, as Mr. Lee has shown them, but [12,884] if this were to continue for a period of time, this process of merging, would that obliterate the separate cones?

A. Assuming that the cones should be separate now, which I don't believe they are,—assuming they should be separate, yes, if deposition continued that would tend to obliterate any distinction between them.

The Court: I understand your testimony to be that the feature of being indistinguishable is on the surface?

The Witness: And in depth, too, your Honor.

The Court: And in depth?

The Witness: Yes. [12,885]

* * * * *

Q. (By Mr. Goldberg): Bearing in mind your testimony previously, Mr. Bean, about the interleaving and interfingering of the fans of the various

(Testimony of Robert T. Bean.)

streams in this area, what effect, if any, does such interleaving have with regard to the formation of vertical barriers to the movement of water?

A. Because of this——

Mr. Rowe: I just want to object to that on the ground he has not been qualified as a hydrologist, as far as I can observe from the record. He has not qualified from any experience he stated or reports or research he made or text of any book he gave to answer that question.

The Court: Overruled.

The Witness: Could I have the question again, please?

(The question referred to was read by the reporter as follows:

("Q. Bearing in mind your testimony previously, Mr. Bean, about the interleaving and interfingering of the fans of the various streams in this area, what effect, if any, does such interleaving have with regard to the formation of vertical barriers to the movement of water?")

The Witness: This interfingering and interleaving has made the alluvial fans merge sufficiently that there are no extensive vertical barriers of any kind in the area between [12,886] fans.

As we see these stringers have penetrated up the valley—if I may speak of "up" as being north and "down" the valley to the south—and the net result has been the streams have been whiplashing in their slow way back and forth across the alluvial Piedmont that there is no boundary between allu-

(Testimony of Robert T. Bean.)

vial fans in depth in the area of which we are speaking, the San Joaquin River area, and that as one goes downward at any given point on the alluvial Piedmont one will encounter sediments which are laid down by different streams. You will not always find sediments that were laid down by the San Joaquin River, or always find at one spot sediments which were laid down by Little Dry. And because of that condition there simply are no extensive vertical barriers.

Q. (By Mr. Goldberg): You say there are no extensive——

Mr. McPherson: You mean Big Dry Creek?

The Witness: Either Dry Creek.

Q. (By Mr. Goldberg): Are there local barriers?

A. Yes, there are local barriers where permeable aquifers pinch out against impermeable beds. Those occur anywhere where alluvial deposits have been laid down by active streams.

The Court: That is the fingering to the edge of the cone [12,887] or the fan?

The Witness: Yes, fingering to the edge of fans where there are distinct fans, but in this area there are not distinct fans.

The Court: They go to the edge of the interfingering then? The interfingering is of the fines, is it not?

The Witness: The fines and coarse both. It is the fact that the coarse deposits interfinger which makes the area essentially have complete intercom-

(Testimony of Robert T. Bean.)

munication of ground water and which results in there being no extensive barriers of any kind.

Q. (By Mr. Goldberg): To follow the court's question, Mr. Bean, I will call your attention again to Plaintiffs' Exhibit 62, and I will ask you if in your opinion, to follow along, for example, the line I previously took, the south boundary of Region No. IV of Plaintiffs' Exhibit 62, which is designated by Mr. Lee as the alluvial cone of Dog, Red Bank and Fancher Creeks, in your opinion is there a collection of fine material along this line at the south boundary of Area IV which distinguishes Area IV from the area to the south?

A. In my opinion, there is not.

Q. And similarly with the line which is the south boundary of Area No. III?

A. There is not. [12,888]

Q. And similarly with the south line of the Area No. II? A. There is not.

Q. Is the Area II distinguishable from Area No. 1, that is, the Ancient alluvial cone of the San Joaquin and the more Modern alluvial cone of the San Joaquin?

A. The areas are distinguishable. I do not believe they are distinguished exactly along the line indicated in Exhibit 62, although I have not checked this line with the geological map Exhibit V. I believe the distinction is best shown on Exhibits V and V-1 where the older alluvium is distinguished from more recent deposits. [12,889]

* * * * *

(Testimony of Robert T. Bean.)

The Witness: There are two wells which show local pressure effects. These local pressure effects are found practically everywhere in free ground water areas in California and also in other parts of the country and the world. [12,922]

* * * * *

Q. (By Mr. Goldberg): Now, Mr. Bean, you have testified that the water table or the water body in the area involved in this proceeding is a free water body? A. Yes, I have.

Mr. Rowe: Isn't that leading?

The Court: It is introductory. Of course it is leading. Apparently he is going to change the subject.

Mr. Goldberg: That is right.

The Witness: It is a free water body east of the area approximately at surface contour 225.

Q. (By Mr. Goldberg): Now in determining that it is a free water body, have you considered the effect of the surface application of irrigation water since the period about 1870? A. Yes, I have.

Q. And what has that effect been?

A. That effect has been to raise the ground water throughout the area indicated, and that is in my opinion the most important indicator to differentiate between free ground water area and a pressure area.

Mr. Rowe: I assume all of this is subject to my objection [12,963] that the witness has not been qualified through experience or study to so testify?

The Court: It may be deemed that you shall

(Testimony of Robert T. Bean.)

have made the objection to the whole line of testimony on that ground?

Mr. Rowe: Yes.

The Court: The objection is overruled. And without restating the objection to each question.

Mr. Rowe: All right.

Q. (By Mr. Goldberg): Assuming, Mr. Bean, that the area in question rather than being a free ground water body was a body under pressure. How would the effect of the surface application of irrigation water have been manifested?

A. If it was a pressure area, surface irrigation water percolating downward could not get to the main water body from which the wells draw. It would only get downward as far as an extensive layer of confining beds such as is shown on Exhibit A-3-A near the surface in the left-hand part of the sketch. And that is the most important differentiation between free ground water area and the pressure area.

I might show it to the court.

The Court: I saw it before.

The Witness: You understand it then.

The Court: But if the water was introduced on the surface and got on top of the confining area it would still raise [12,964] the water near the surface, would it not?

The Witness: It would raise what is known as a perched water or a shallow water body.

The Court: But it would still be nearer the surface?

(Testimony of Robert T. Bean.)

The Witness: It would still be nearer the surface, but that is not the zone that the wells pump from with the exception of any possibly very shallow domestic wells.

In other words, any deep wells would not be able to take from the water body which is replenished by percolating ground water in the case of a pressure area. Percolating water from the surface, return water, would simply raise the water level of the very shallow water table. Probably there would be a drainage problem, a swampy area in that case. But that is not what has happened in the Fresno area. That water has percolated on downward until it reached the main water body and has raised that main water body considerably.

Q. (By Mr. Goldberg): Now in determining that this area has a free ground water body as distinguished from a pressure water body, if you want to call it that, have you considered——

Mr. Rowe: Will counsel define "this area"?

Mr. Goldberg: The area we are concerned with in Rank vs. Krug.

Mr. McPherson: May I ask what that is?

The Court: He has testified that a free water body lay [12,965] easterly from——

Mr. McPherson: The 225 foot contour, he said.

The Court: ——the 225 foot contour, approximately Gravelly Ford?

The Witness: That is correct.

Q. (By Mr. Goldberg): The area east of Gravelly Ford, that portion of the area east of Gravelly

(Testimony of Robert T. Bean.)

Ford which we have heretofore described as the Fresno plains.

Have you considered the variation of level of water in wells in determining whether this area is underlain by a free ground water body or a pressure ground water body?

A. I have. And I consider that a very important method of determining whether it is free ground water or pressure water.

Q. And what have you found on the basis of that consideration?

A. I have found that no matter what the depth of the well, the water level in the well is concordant and comparable with water level in adjacent wells.

In other words, if a person takes and studies wells which are near to each other, one well shallow and the other well deep, he finds that the water level in the two wells is very similar and both of them fit in with the same ground water surface when it is contoured. [12,966]

Now we have one exhibit in evidence—I believe it is KK—which is an exhibit of paired wells and it shows these levels.

The Court: Of what?

The Witness: Of paired.

Mr. Goldberg: May we have Defendants' KK, Mr. Eiland?

The Witness: I might suggest that that answers the question which the court was just bringing up about the difference between shallow water and pressure water very well because if it was a pres-

(Testimony of Robert T. Bean.)

sure area the shallow wells would show a different level from the deep wells as can be illustrated by Exhibit A-3-A.

We show on the left-hand side of Exhibit A-3-A in the pressure area two different levels, the level of the shallow water table and the level of the pressure surface. They are different levels.

The Court: Now do they have artesian wells above the 225 foot contour line before irrigation if this was, you say—is, as you say, this shallow water table is added by perching?

I guess we had better recess.

(Whereupon, at 12:00 o'clock noon, a recess was taken until 2:00 o'clock p.m. of the same date.) [12,967]

Fresno, California, November 13, 1952,

2:00 O'Clock, P.M.

The Court: Proceed.

ROBERT T. BEAN

the witness on the stand at the time of recess, having been previously duly sworn, resumed the stand and testified further as follows:

Direct Examination—(Continued)

Mr. Goldberg: There was a question by the court. Will you read it?

(The record referred to was read by the reporter, as follows:

(Testimony of Robert T. Bean.)

("The Court: Now do they have artesian wells above the 225 foot contour line before irrigation if this was, you say—is, as you say, this shallow water table is added by perching?")

The Witness: Is adding by perching?

The Court: Well, added, and perches.

Mr. Goldberg: Added before irrigation?

The Court: At irrigation.

The Witness: I am afraid I don't understand the question.

The Court: I understood you to say that this shallow water table, which you had down toward the westerly end of your diagram there, was added after the introduction of irrigation [12,968] water to the surface.

The Witness: If you understood that, I did not mean to indicate that.

The Court: Very well.

Q. (By Mr. Goldberg): You mean the shallow water table existed before irrigation?

A. Before irrigation water was put on.

The Court: And that was the artesian zone?

The Witness: That was the artesian zone.

The Court: And that is where the water came from for artesian wells, the shallow water table?

The Witness: No, it came from the deep pressure body.

The Court: In other words, the artesian well would have to go into and below the shallow water table?

(Testimony of Robert T. Bean.)

The Witness: That is correct, in fact, below the confining bed.

The Court: Below the confining bed?

The Witness: Yes.

Q. (By Mr. Goldberg): And before irrigation, the pressure surface was actually above the surface of the ground, was it not?

A. Wherever it was artesian, that is right, the pressure surface was above the surface of the ground.

Mr. McPherson: May I ask a question, to clear the record? [12,969]

The Court: Yes.

Mr. McPherson: If a well were put into the area, say, west of the 250-foot contour but not deep enough to penetrate the clay, and would take its water only from the upper or shallow water body, would it show any pressure?

The Witness: The only pressure it could possibly show would be local, and I am very doubtful if there is any local pressure down there. In fact, in general the answer is no. [12,970]

* * * *

Q. (By Mr. Goldberg): Mr. Bean, if I recall correctly you had started to [12,976] answer my question with regard to distinguishing this area as we described it this morning as having a free ground water table from one pressure ground water body by the behavior of wells. Can you complete your description or your statement as to how that

(Testimony of Robert T. Bean.)

distinction can be based upon the behavior of water in wells?

A. I stated that the most important evidence was this evidence of paired wells, that water levels in both shallow and deep wells nearby each other were in essential agreement, no marked difference between them.

There are other behavior characteristics of water in wells which are of interest here. Pressure areas or wells in pressure areas have extremely extensive cones of depression and these cones of depression affect unused wells in the same area very markedly, very quickly and at considerable distances from the pumped well.

In a free ground water table, however, the cone of depression of a pumping well is much smaller, much more local and affects unused wells only which are much nearer, the reason being that in a free ground water body the actual cone of depression has to be dewatered, the water from that cone of depression moves into the pumping well, and that is a slow process.

But in the pressure area the cone of depression does not represent actual dewatering throughout the area of this [12,977] effect, it is a real thing, however, because wells which exist throughout the area of its effect and are not pumped show these marked characteristics of pressure movement.

In other words, they drop quickly when there is an effect of a pumping well and they recover quickly after that well is shut off.

(Testimony of Robert T. Bean.)

The Court: The pressure well, or the cone of depression in a pressure well, is larger than a free zone?

The Witness: Yes.

Mr. Rowe: May I, just to get the record clear, did he say the well that was pumped dropped quickly or was it the neighboring well that dropped quickly?

The Court: Both, in a pressure zone.

Q. (By Mr. Goldberg): What was your answer to that, Mr. Bean?

A. My statement is that it is the neighboring well that drops quickly. Now the pumped well will also drop quickly but it is the neighboring well that is the important thing that makes the difference.

If you have two wells at comparable distances from a pumped well—let me put it this way:

You have two wells which are at the same distance from each other, one set in a pressure aquifer, the other set in a free ground water aquifer. The unused well in the pressure aquifer will drop much more quickly when the other well is [12,978] pumped than the unused well at the same distance from a pumped well in a free ground water area.

Q. (By Mr. Goldberg): Now what is the reason for that, Mr. Bean?

A. The reason is that there is actual dewatering of the cone of the depression in the free ground water area and not in the pressure area. The effect of the cone in a pressure area where the actual dewatering is only in the forebay might be made analogous to a similar effect that we are all familiar

(Testimony of Robert T. Bean.)

with in, let us say, a tank of water about the size of a swimming pool. There is actually no dewatering—bear this in mind—in the vicinity of the pumped well in the pressure area. That well-confined aquifer down there is full of water and there is simply slight movement toward the well, enough so that the water will be pumped out. But there is no physical cone of depression down there.

The Court: There is not any cone of depression, is there?

The Witness: There is a cone of depression from the pressure surface which is marked by any wells in the vicinity.

The Court: But there is actually no voiding of water?

The Witness: That is correct, there is no voiding of water underneath the well. The voiding only occurs in the intake area at some distance, and that effect is transmitted very quickly, and that is the point. [12,979]

The Court: Then the water level remains the same in a pressure well?

The Witness: No, sir, that is incorrect. The water level underneath the confining bed remains right where it was. In other words, if it was chalk up against the underneath part of the confining bed and does not pull away from that.

The Court: So they do not have a cone of dewatering?

The Witness: Not a cone of dewatering, that is correct. But if there is another well at a mod-

(Testimony of Robert T. Bean.)

erate distance from this pressure well, also in the pressure aquifer, that well will very soon drop, and it is the measurement of the fall in that pressure surface as shown by nearby wells that we call the cone of depression in the pressure aquifer.

Mr. McPherson: Isn't that called in your trade a cone of pressure relief as distinguished from a cone of depression?

The Witness: That is very good. That is correct.

The Court: The cone of depression is actually a cone that is devoid of water?

The Witness: That is correct.

The Court: Then I do not understand how in a pressure well the cone of depression is greater than it is in a well that is in a free water table where you do not have any cone of depression.

The Witness: The cone of pressure relief is greater, [12,980] and I was going to try to indicate the manner of its occurring. Yes, it is shown in some of the texts which we have in evidence. They are in agreement with me on this point.

However, I shall try to explain it by this method: Suppose you had a swimming pool and that swimming pool is full of water and you take several tubs of water, if the swimming pool is full to a certain level, you take several tubs of water over to one corner of the swimming pool and you color that water, put ink in so it is a different color from the water in the swimming pool, and you pour those tubs of water into the corner of the swimming pool,

(Testimony of Robert T. Bean.)

the water level will rise all over the swimming pool almost immediately and yet the colored water, the inky water, will not move very far from the actual corner where it is pushed in or it is poured in.

The effect is exactly the same thing as occurs in a cone of pressure relief only the reverse. There is little actual movement of water, simply movement of water in from the forebay to replace what is pumped out.

The Court: By the "forebay" you mean what?

The Witness: The free ground water area which is the intake area to supply the pressure area off to the side.

Q. (By Mr. Goldberg): Now in your analogy to the swimming pool, Mr. Bean, did you mean to imply that the inky water would remain more or less in the vicinity of the place where it was poured in [12,981] forever?

A. No, no. It of course begins to diffuse throughout the whole body of water. But the raising of water throughout the swimming pool occurs only almost immediately before the inky water has a chance to diffuse, and that is a hydraulic effect and the cone of pressure relief is also a hydraulic effect rather than a voiding of water.

The Court: Now the swimming pool is a free water table, is it not?

The Witness: Yes, sir. [12,982]

* * * * *

Q. (By Mr. Goldberg): Let's see, we got off on this discussion. In the course of your response

(Testimony of Robert T. Bean.)

to my question back on page 13,122 of [13,164] the transcript, the following appears:

"Q. Now, you are also familiar, Mr. Bean, with the testimony of Mr. Lee to the effect that there were pressure aquifers leading from the river down to the general vicinity of the city of Fresno and, as I recall his testimony, which pressure aquifer supplied a principal portion of the water pumped from the wells in the City of Fresno. Are you familiar with Mr. Lee's testimony to that general effect?"

You stated you were familiar with that. Then I asked you if, in your opinion, such aquifers existed. Well, I will read the question:

"Q. In your opinion, do pressure aquifers exist of the source, course, character and capacity described by Mr. Lee?"

And you stated in your opinion they do not; and the discussion which we have now been engaged in was generated by your statement that to have such an aquifer it would have to be absolutely impermeable, and no such impermeable aquifer existed.

Now, in addition to the fact that such an aquifer would have to be absolutely impermeable, in your opinion,——

The Court: The aquifer would have to be impermeable?

Mr. Goldberg: I am sorry, the materials surrounding it [13,165] or at least overlying it——

The Witness: Surrounding it.

Mr. Goldberg: Beg pardon?

(Testimony of Robert T. Bean.)

The Witness: Surrounding it.

Q. (By Mr. Goldberg): Surrounding it?

A. Yes.

Q. You mean to say that an aquifer having the characteristics described by Mr. Lee would have to be a pipe? A. Yes, sir.

Q. It couldn't be formed by having an overlying continuous bed, merely an overlying continuous bed, such as you have shown, for example, on Exhibit A-3-A, and such as is shown by the Corcoran clay on Defendants' Exhibit AA?

A. No, it could not, because the ground water gradient is in opposition to movement of water in such an aquifer; therefore it would have to be completely sealed from the ground water gradient, as is shown by all the wells which we have a record of.

Mr. McPherson: I don't understand that answer. You say "as is shown." What do you mean, that there has been a showing to that effect?

Q. (By Mr. Goldberg): You mean the wells show the ground water gradient?

A. The wells show the ground water gradient to have a [13,166] ridge between the San Joaquin River and the City of Fresno. Any aquifer carrying water in opposition to that ground water gradient would have to be completely sealed on all sides from the rest of the ground water.

The Court: Regardless of its depth below the surface?

The Witness: Oh, yes, it would have to be completely sealed, regardless of its depth.

(Testimony of Robert T. Bean.)

The Court: You couldn't have a ridge there and have an aquifer underneath it?

The Witness: If such an aquifer everywhere was completely sealed from the ground water which exists in the ridge, I suppose it could exist.

The Court: Well, suppose it was sealed on the sides and bottom but not on the top, and it was 50 feet below the ridge, or 100 feet, and runs transverse or at right angles to the ridge.

The Witness: No——

The Court: Wouldn't that water flow down that aquifer?

The Witness: No, sir, because we have no evidence of any geologic structure which would permit that.

The Court: I mean, assuming that there is——

The Witness: You have indicated that it wasn't confined.

The Court: I have indicated it was confined on the sides and the bottom, such as the San Joaquin River is [13,167] today, with whatever you call it——

The Witness: Entrenched.

The Court: ——in the bottomlands.

Q. (By Mr. Goldberg): Assume an underground flume.

A. The answer is no, it would have to be confined.

The Court: It would have to be confined?

The Witness: Yes.

(Testimony of Robert T. Bean.)

The Court: That water would change its course of flow, too?

The Witness: In response to the ground water gradient?

The Court: Yes.

The Witness: Yes, it would.

The Court: Well, how would it flow up out of these banks, these impervious banks?

The Witness: There would be very little, if any, tendency for it to flow anywhere else, because the gradient is across your channel, not down it, and as long as——

The Court: Suppose the bottom of the channel were a different gradient, an impervious body; suppose it took off in the vicinity of Pinedale, and was buried 100 feet or 150 feet deep, and was an old channel such as the San Joaquin River is today, and flowed down across through the northwest portion of the City of Fresno, and then it was covered over with, oh, clay beds and so forth, but that it remained there: [13,168] that water wouldn't flow down the channel? Say the slope of the bottom of that was four feet to the mile.

The Witness: It would not flow down that channel, and I think we have an important point here, your Honor. The gradient of the bottom of a submerged channel doesn't affect the direction of water movement in that channel. The water again moves in response to the general ground water gradient of the area; and if you have an individual channel trending downhill in a certain direction, either on

(Testimony of Robert T. Bean.)

top of an impervious bed or on top of the basement complex, or anything of that nature, the water doesn't flow down that channel. It flows in the direction of the ground water gradient. [13,169]

The Court: How do you account for that?

The Witness: Well, I account for it by the law of gravity.

The Court: Doesn't water flow downhill? How does that water get uphill then? How did this channel flow up, crosswise to the way it flowed before the ridge was built up if it flowed that way before the ridge was built up?

The Witness: I am not sure that I understand your question.

The Court: Well, assume that there was no ridge and that—what is that exhibit that you call the whiskbroom exhibit?

Mr. Goldberg: The haystack exhibit?

The Witness: That is Exhibit C.

The Court: Do you have it there?

The Witness: No.

The Court: Suppose that those were all channels of the San Joaquin River.

The Witness: All right.

The Court: And comparable to the one that exists today—I do not mean perhaps in depth but with banks and impervious sides and with alluvium at the bottom at any depth, 20 feet or more?

The Witness: Yes.

(The exhibit referred to was passed to the witness.)

(Testimony of Robert T. Bean.)

The Court: And that a ground water ridge is then built up between these channels, you mean the water would not [13,170] continue to flow down here (indicating)?

The Witness: In other words, you consider a ground water ridge to lie approximately as my pencil lies?

The Court: Say a little closer to the river.

The Witness: My pencil now parallels the river about one-half inch from it on Districts' C. Now your question is what?

The Court: Before that ridge was built up, which way would the water flow in these aquifers, and suppose that each one of these had a gradient that is comparable to the present gradient of the San Joaquin River, the figure which I do not recall.

The Witness: Now are you considering, your Honor, that the aquifers at the time of your question are underground or are they at the surface?

The Court: They are underground.

The Witness: They are underground?

The Court: Yes, and there has not been any ground water ridge built up yet.

The Witness: It depends still of course upon the ground water contours. Now if the ground water contours should indicate that perpendicular to them is down the aquifer, yes, the water would move down the aquifer.

The Court: Well, suppose there is no water at all above the level of the topmost of these aquifers?

The Witness: No ground water at all? [13,171]

(Testimony of Robert T. Bean.)

The Court: No ground water at all. Then the water would flow down the aquifers, would it not?

The Witness: It still would depend on the ground water gradient. If you are considering what the ground water gradient is down the aquifer, as you say, yes, it would.

The Court: Suppose there is no way for water to get into these underground aquifers except at this point which is indicated up here—I do not know what you call it.

The Witness: That is marked "R" below Friant Dam?

The Court: Yes, and the water flows down the San Joaquin, would it enter these aquifers?

The Witness: I had better have all of the hypotheses of the question, all the suppositions.

The Court: I will have to probably restate them to you.

The suppositions are that these aquifers exist, that they have gravel and cobble beds beneath them, not necessarily the same size but of the same nature as that which now exists underneath the San Joaquin River?

The Witness: All right.

The Court: And that there is no ground water table underground above the level of the water in these aquifers, and that the only place for water to enter these aquifers is at this point of juncture between the underground aquifer and the San Joaquin River at Point "R" on Districts' Exhibit C.

Now which way would water flow that entered

(Testimony of Robert T. Bean.)

those aquifers, [13,172] and the gradient is comparable to that now in the San Joaquin River?

The Witness: If the gradient is down the aquifer——

The Court: When I say "gradient" I mean the grade of the bottom of the aquifer, let us assume four feet to the mile—I do not know whether the San Joaquin is that or not.

The Witness: If the gradient of the water is down the aquifer, as it would have to be for water to move down the aquifer, then water certainly would.

The Court: Well, the grade of the aquifer in the bottom of the aquifer is four feet to the mile.

The Witness: Yes.

The Court: Assume water enters here (indicating), where will it flow?

The Witness: It will flow down the aquifer.

The Court: It will flow down the aquifer, is that not right?

The Witness: That is correct; yes.

The Court: And it will flow down there because the grade is there and because the material is more pervious than that on the banks or the old banks?

The Witness: And because there is no ground water gradient opposing it.

The Court: Then suppose on top of that there is built up a ground water ridge. These would not continue to flow [13,173] in that direction?

The Witness: Not if they are underground and then under the influence of an opposing ground

(Testimony of Robert T. Bean.)

water gradient as they would be between the river and the ridge.

The Court: What would they do, flow back up the aquifer or flow across? How would they get out of those confining beds, out of the confinements of these cobble beds?

The Witness: Well, in the first place there is gradual seepage through the walls, because I do not believe it is a correct picture to state that the aquifers are completely pervious and everything else is completely impervious.

The Court: I did not say that. I say that the bottom of the aquifer, that there is 20 or 30 feet of—I do not care—which is comparable to the material which lies now below the bed of the San Joaquin River, which from the testimony is cobbles and sand and gravel, and that the banks or the sides or bottoms of these aquifers are comparable to what is called tuffaceous, or the banks and bottom of the present San Joaquin River, and the top is general alluvium. Would not the water flow more readily down through the cobbles and the sand and the gravel?

The Witness: It moves more readily through them; yes.

The Court: Would not there be a pressure there if the grade was four feet to the mile?

The Witness: The pressure is always down the gradient [13,174] of the ground water, not down the gradient or slant of whatever channels exist beneath the surface.

(Testimony of Robert T. Bean.)

Water might have a tendency to move, let us say, a short distance down a component of the direction of slope of the ground water table in such a channel as you have indicated, but wherever it finds the least type of break it will immediately move out through any possible semi-pervious confined beds, or as soon as it intersects one of these other distributaries it will flow in large quantity down the ground water gradient.

The Court: One other assumption. The assumption is that the flow in the river here is not changed when this ridge is built up, that the intake here, or the source for the intake, is the same as it was before. Now that water would all flow toward the river, it would not flow down these aquifers at all?

The Witness: You are absolutely right.

The Court: What do you mean, I am right?

The Witness: As long as there is a ground water ridge the water between the ridge and the river flows to the river in the aquifers in the beds in between the aquifers. It flows from the ridge to the river.

The Court: Then it is not a law that water seeks its lowest level?

The Witness: Yes, it is. That is exactly why it does [13,175] flow from the ridge to the river.

The Court: But suppose these aquifers are below the present bed of the river, or suppose they are below the water surface of the river?

(Testimony of Robert T. Bean.)

The Witness: Well, that ground water zone, the ground water body below the level of the river is a continuous ground water body.

In other words, you consider it something like this: Consider it as a pail of sand full, say, to within an inch or so of the top of water. In other words, the bottom part of that sand is saturated.

Well, now, a spoonful of water, let us say, which lies at the top of that saturated zone inside the pail does not move down to the bottom of the pail because the whole thing is saturated. There is no reason for that to move down just because it is up above the bottom of the pail.

In other words, because this whole area is saturated like a pailful of sand and interconnected like all interstices of a pailful of sand, there is no reason for any water in the upper part of that to move straight down a specified place because it is supported all around by water already.

The Court: I just want to understand your testimony, then, that on the assumptions I have made and these not having an impervious bed at the top, the water would not flow down those aquifers, assuming the grade is four feet to the mile [13,176] and the other assumptions, that it would change its course and direction when there is a ground water ridge built up on top of it?

The Witness: That is correct. That is my testimony. [13,177]

* * * * *

Mr. McPherson: And in order to assist the court and keep the record complete, we have prepared a map of the area showing in color the area served by the Friant-Kern Canal and the area served by the San Joaquin River, being Bureau Drawing 214-204-2300, and ask that it be given the same exhibit number as the map attached to the statement just received, a sub-number under it.

The Court: This will be A-6-A-2.

(The document referred to was marked Defendants' Exhibit A-6-A-2 for identification.)

The Clerk: Are these last three exhibits for identification or in evidence?

The Court: They are in evidence. [13,284]

(The documents referred to were received in evidence and marked Defendants' Exhibits A-6-A, A-6-A-1, and A-6-A-2.)

(Reporter's Note: The exhibits above referred to are physically inserted in the transcript herewith:) [13,285]

DEFENDANTS' EXHIBIT A-6-A

United States Department of the Interior, Bureau of Reclamation, Office of The Regional Counsel, Region 2, Sacramento, California.

Map entitled "Status of water service contracts of water users' organizations," case of Rank v. Krug, Civil No. 685-ND.

L. K. Hill, Regional Water Rights Engineer, October 9, 1952. [13,286]

The drawing entitled "Status of water service

Defendants' Exhibit A-6-A—(Continued)

contracts of water users' organizations," dated April 7, 1952, shows the location of the Friant Dam on the San Joaquin River, the Madera, Friant-Kern, and Delta-Mendota Canals; and the various organizations that have requested water service from the Central Valley Project in the valley area between the Merced River on the North and the Tehachapi Mountains on the south. The San Joaquin River is indicated by the blue color on the map, and the project canals are indicated by the red color.

The areas of the irrigation districts or water users' organizations that have executed contracts with the United States for water service from the Madera and Friant-Kern Canals are indicated by the green and purple colors. These two colors are used to distinguish the area of the districts from each other. [13,287]

On the Friant-Kern Canal, thirteen districts with a total area of 443,960 acres have contracted for a total of 456,300 acre-feet of Class 1 water annually, and a maximum of 651,200 acre-feet of Class 2 water annually. All water quantities are canal side deliveries.

On the Madera Canal, two districts, with a total area of 176,492 acres, have contracted for a total of 140,000 acre-feet of Class 1 water, and 346,000 acre-feet of Class 2 water.

The areas of the districts for which studies are now in progress concerning a water supply from the Friant-Kern and Madera Canals are shown in the orange color. Four of these areas along the

Defendants' Exhibit A-6-A—(Continued)

Friant-Kern Canal, totaling approximately 197,706 acres, have been allocated 108,700 acre-feet of Class 1 water and 386,000 acre-feet of Class 2 water annually; and one area of 9,992 acres that will receive service from the Madera Canal has been allocated 14,000 acre-feet of Class 2 water annually.

Some 11,343 acre-feet of Class 1 water have been earmarked for lands which have been included in districts subsequent to the execution of contracts; and 33,657 acre-feet of Class 1 water and approximately 1,900 acre-feet of Class 2 water have been allocated to provide water for additional inclusions and for indicated shortages in existing contractual quantities.

A grand total of 750,000 acre-feet of Class 1 water and 1,400,000 acre-feet of Class 2 water either have been contracted for or allocated from Millerton Lake for delivery through the Friant-Kern [13,288] and Madera Canals. Of these totals, 596,300 acre-feet of Class 1 water and 997,200 acre-feet of Class 2 water actually have been contracted for to date.

Six areas for which studies are now in progress for the delivery of Central Valley Project water from the Delta-Mendota Canal are indicated by the yellow color. At present, no firm water allocations have been made for these six areas.

A summary showing status of water service contracts of water users' organizations that have requested service from the Friant-Kern and Madera Canals is given in the attached tabulation. [13,289]

(The document referred to was received in evidence and marked Defendants' Exhibit A-12-A.)

(Reporter's Note: The exhibit above referred to is physically inserted in the transcript herewith:) [13,453]

DEFENDANTS' EXHIBIT A-12-A

Apparent Annual Losses and Gains in the Flow of San Joaquin River Between Friant and Skaggs Bridge and Whitehouse—March 25, 1952.

* * * * *

Dam, and is maintained by the San Joaquin Canal Company. Records of flow at this station are available from 1901 to September 1951.

4. The Skaggs Bridge gaging station was located about 33.2 river miles downstream from Friant Dam and was operated and maintained by the Southern California Edison Company, Ltd., for the period 1931 through 1939.

5. River losses between Friant and Whitehouse, 1908-1944. An analysis of the flow of the San Joaquin River at Friant and Whitehouse gaging stations for the period 1908 through 1944, the year of initial operations of Friant Dam and reservoir, indicates that during this 37-year period an average of 1,715,843 acre-feet annually (2,370 c.f.s) passed the Friant gaging station, and 1,574,226 acre-feet annually (2,174 c.f.s.) passed the Whitehouse gaging station. During this period, an average of 141,600 acre-feet annually, or about 196 c.f.s., was lost on the fifty-mile stretch of the river from all causes such as gravity and pump diversions, evaporation,

percolation, transpiration, and unmeasured overflow during flood periods. However, during this

Defendants' Exhibit A-12-A—(Continued)

37-year period, there were seven years in which the river was a gaining stream.

6. For the ten-year period just prior to the initial operation of Friant Dam, 1935 through 1944, an average of 197,000 acre-feet annually, or 272 c.f.s., was lost from all causes between Friant and Whitehouse.

7. The maximum loss for the 1908-1944 period occurred in 1911 when 942,500 acre-feet (1,302 c.f.s.) was lost between Friant and Whitehouse. That year a total of 3,560,000 acre-feet passed the Friant gaging station, which was over twice the average for that station during the 1908-1944 period, and water spread widely over the lands between Friant and Whitehouse, especially between March 3 and August 7, when the flow was never less than * * * * * [13,456]

LELAND K. HILL

the witness on the stand at the time of adjournment, resumed the stand and testified further as follows: [13,523] * * * * *

Q. (By Mr. Rowe): Neither can any increase to the river, additional inflow from discharge from the Fresno Irrigation District, raintall or percolating inflow from the Fresno Irrigation District, be determined from anything in Exhibit A-12-A, colored charts or any other table in there?

A. No, not as presented in this study because we did not make such a study. [13,575] * * * * *

ROBERT T. BEAN

recalled as a witness herein, having been heretofore duly sworn, resumed the stand and testified further as follows:

Direct Examination—(Continued)

Q. (By Mr. Goldberg): Mr. Bean, when you were last on the stand,——

The Court: Let's see, this is still your direct, isn't it?

Mr. Goldberg: Yes, it is still the direct. It was not completed.

Q. When you were last on the stand, Mr. Bean, —which was on Tuesday, November 18th—I had asked you to assume Mr. Lee's evidence that there was an aquifer leading from the river to the City of Fresno and supplying water to the wells of the City of Fresno, and asked you to compute the size of that aquifer to be able to supply 25,000 acre-feet of water a year. [13,586]

I would like to amend that question to bring it down to supplying merely 5,000 acre-feet of water a year. Have you made such computation?

A. Yes.

Q. And what is the size of such an aquifer, as you have computed it?

A. In making that computation, I took the gradients of the water levels existing at the approximate position in the vicinity of the Fort Washington Terrace, which Mr. Lee indicated to us on the field trip was the possible taking-off point for the aquifer, and the water levels at the City of Fresno,

(Testimony of Robert T. Bean.)

and that gives a gradient of approximately 50 feet, a drop from that position to the—near the bottom of the cone of depression in the City of Fresno, and the distance is on the order of nine miles.

The permeability which I used in making this computation is the permeability which is indicated in the paper in evidence by Mr. Lee, Exhibit M.

Q. That is Mr. Lee's paper published in the American Geophysical Union?

A. That is correct. And on page 543 of that paper, Mr. Lee——

The Court: Let me see that exhibit.

Mr. Goldberg: Do you know if that is Districts' M?

The Court: I think it is Defendants'. [13,587]

The Witness: I do not know.

Mr. Goldberg: It is Defendants' M.

(Exhibit handed to the court.) [13,583]

The Witness: On page 543, Table 1, Summary of Tests of Permeability, Coefficient for Samples of Natural and Consolidated Materials"——

Mr. Rowe: Not to interrupt, if the court please, but this is all subject to my objection that this witness is not qualified as a hydrologist and has not been qualified to give testimony of this type.

The Court: It may be deemed that your objection shall be made to each question asked this witness concerning his opinion on any matters of hydrology without repeating it. And the objection will be overruled.

The Witness: Now I took as a permeability a

(Testimony of Robert T. Bean.)

figure even larger in order to give full benefit to the greatest permeability that could conceivably exist in material underground.

Q. (By Mr. Goldberg): You figured even larger that what, Mr. Bean?

A. Even larger than the highest figure shown for coarse sand and gravel by Mr. Lee in this table—excuse me—highest than the average highest figure shown for coarse sand and gravel.

For coarse sand and gravel he indicates his average figure is 1845——

The Court: Gallons?

The Witness: ——gallons per day under a hundred percent hydraulic gradient. [13,589]

I took a figure of 2000 gallons per day to round it off and make it as large as it could conceivably be.

The Court: By the way, your question is 5000 acre-feet a year?

Mr. Goldberg: Yes, that is right.

The Witness: Now further in making this determination, I used the formula which is the fundamental formula of the flow of ground water, that is, Darcy's Law, and it is Q equals P i a. In other words, the amount of water is equal to the permeability multiplied by the slope, multiplied by the area of cross-section.

Mr. Goldberg: Excuse me, Mr. Bean.

Q. This formula, Darcy's Law, Q equals P i a, is that "P" the same as the "K" in Mr. Ingerson's formula?

(Testimony of Robert T. Bean.)

A. It is a different unit but the formula is exactly the same. Any formula is only true if the units which are used in both sides of the equation are commensurate.

Now in Mr. Ingerson's formula he comes out with a velocity. In my formula, the one I am just presenting to you, I come out with an amount of water. And the reason we come out with different things is that he uses "K" and that I use "P." The two constants changed from one to the other by multiplying by known quantities.

Now in that formula, Q equals P i a, according to your question you asked me for the cross-section area of the aquifer [13,590] which would be necessary, so "a" is the unknown in that formula. Solving that formula for "a" which is the cross-sectional area of an aquifer required to carry 5000 acre-feet per year to Fresno, which I understand is approximately one-tenth of the amount which is pumped by the city of Fresno, if that aquifer were 100 feet deep that aquifer would have to be four miles in width and, of course, nine miles long. But its cross-sectional dimensions would be approximately 100 feet by four miles. Actually a little better than four miles. In square feet the cross-sectional area is approximately 2,160,000 square feet.

Q. Now so that I understand you correctly, suppose that instead of the depth of the aquifer being 100 feet, a depth of 200 feet, that would reduce the necessary width down to two miles, would it?

A. That is correct.

(Testimony of Robert T. Bean.)

Q. To bring water to the city of Fresno, as I understand your testimony, this aquifer would have to be covered throughout its length with an impermeable bed or capped?

A. That is correct. For water to go contrary to the ground water gradient it would have to not only be covered but it would have to be completely surrounded by impermeable material.

Q. Now, Mr. Bean, in your opinion could an aquifer of these dimensions and completely surrounded by impermeable [13,591] material exist without having some objective manifestation of its existence?

A. In my opinion, it could not.

Mr. Rowe: I object to that as indefinite and uncertain.

The Court: Objection sustained.

Q. (By Mr. Goldberg): Mr. Bean, if such an aquifer existed what, in your opinion, would be the objective indications of its existence?

A. There would be a certain ground water zone existing between the San Joaquin River and Fresno which would exhibit a continuous downhill gradient from the San Joaquin River to Fresno as shown by wells which were drilled to this aquifer or zone and which would, the water levels of these wells show the continuous gradient downhill from the San Joaquin River to Fresno, and no such zone exists as shown by the fact that although a great many wells have been drilled to a great many depths in the area between the San Joaquin River and Fresno,

(Testimony of Robert T. Bean.)

no wells can be found which show this continuous downhill gradient. Instead all wells show a ridge existing, a ground water ridge existing, between the San Joaquin River and the city of Fresno.

Q. Now in making the statement that you have just made, have you considered the exhibit prepared by Dr. Gardner, the exhibit of paired wells, Defendants' Exhibit KK? A. I have. [13,592]

Mr. Goldberg: May I have Defendants' KK, Mr. Eiland?

(The exhibit referred to was passed to counsel.)

Q. (By Mr. Goldberg): You state that you have considered this Exhibit KK? A. Yes.

Q. In your opinion——

The Court: Hold it up and let me see what it looks like.

(Exhibiting exhibit to the court.)

Mr. McPherson: It is paired wells, your Honor.

Mr. Goldberg: It is paired wells, your Honor.

The Court: Very well.

Q. (By Mr. Goldberg): In your opinion, does the exhibit, Exhibit KK, support your conclusion?

A. It most certainly does.

Q. Will you state your reasons?

A. Well, on Exhibit KK are shown wells which have been drilled in the arc which we have just been speaking of, the area between the San Joaquin River and the city of Fresno, in the general vicinity of where such an aquifer, if it existed, would have to go, and none of the wells show a ground

(Testimony of Robert T. Bean.)

water gradient going from the San Joaquin River continuously downward to the city of Fresno, even though wells at a great variety of depths are shown on this exhibit, and certainly if such an aquifer even approaching the dimensions necessary for [13,593] water to move in any amount whatsoever toward Fresno existed that aquifer would be reached and would have water drawn from it by some of the wells.

No wells show anything of the kind. Instead all of them conform to the general ground water gradient of the area, ground water gradient of the free ground water area, which exists there, and that gradient is practically at right angles from a line drawn from the San Joaquin River to the city of Fresno. [13,594]

* * * * *

Cross Examination

Q. (By Mr. Rowe): Mr. Bean, in regard to your qualifications, just so the record is clear, where you said that in 1942 and from '42 to '46 you worked for the United States Forest Service, that was not an appointment in the regular sense of the word, that is, you were not free to quit and you didn't draw a salary?

A. I was not free to quit except that within civilian public service there were a number of different types of jobs which could be taken and I could have requested a transfer to a medical experiment or some of our men were parachute fire fight-

(Testimony of Robert T. Bean.)

ers in the Pacific Northwest, but I chose to stay with the Forest Service because that was the type of work which I was trained to do and I was making a valuable contribution and getting valuable experience there. [13,659]

Q. Now to answer my question, you were never employed by the Forest Service in any geological work, that is, using employment in the commonly accepted sense.

A. I would have to look at a dictionary definition of employment to be able to answer that yes or no.

The Court: I think, Mr. Bean, you know what he is talking about. Actually you were subject to the draft——

The Witness: That is correct.

The Court: ——you were a conscientious objector and you chose not to bear arms and you were assigned your choice of camps or your choice of work.

The Witness: That is correct.

The Court: And you took that. You were not free to quit, I mean you did not seek employment and they did not hire you.

The Witness: They didn't hire me but I worked for them.

The Court: I know you worked for them, but you either had to go there or somewhere else.

The Witness: That's exactly right.

Q. (By Mr. Rowe): Now on November 12, page 12,827—Mr. Goldberg, if you want to show him this

(Testimony of Robert T. Bean.)

page—the court asked you the question and you gave the following answer:

"The Court: So you had three full quarters at Stanford? [13,660]

"The Witness: Yes, but only two of those was I a student, the other I was on the faculty."

Now is that statement true or false?

A. That is a true statement.

Q. It is? [13,661]

* * * * *

Q. Now, Mr. Bean, does an aquifer, say not a single aquifer but a combination of aquifers extending four miles at 100 feet deep, does that seem something out of the ordinary to you?

The Court: Four miles——

Mr. Rowe: Four miles wide and 100 feet deep, a combination of aquifers that would average that, is that something startling to you?

The Witness: The figure which we determined, Mr. Rowe, was not a combination of aquifers. It was a single aquifer, all having the high permeability we assigned to it.

Q. (By Mr. Rowe): If you had one aquifer running to one well, and another to another, but the combination equaled 100 feet by four miles, would that seem extraordinary, in the San Joaquin alluvial cone, between the City of Fresno and Fort Washington Terrace?

A. The combination of aquifers like that,——

Mr. McPherson: Wait a minute; you changed your premise, Mr. Rowe: It is not four miles——

(Testimony of Robert T. Bean.)

Mr. Rowe: I say from the City of Fresno, an aquifer four miles long and 100 feet deep.

The Court: It is five miles wide? [13,819]

Mr. Goldberg: Five miles wide?

Mr. Rowe: Pardon me; four miles wide and 100 feet deep along the area of the San Joaquin River, say lying between Ledger Island and Pinedale: Does that seem to you an impossibility?

The Witness: Having the permeability which would be necessary to transmit this amount of water, I would say it does sound like an absolute impossibility.

Q. (By Mr. Rowe): It does? A. Yes, sir.

Q. And what do you base your feeling or assumption on?

A. In part upon the permeability of the materials in that area, as I observed it and as that permeability has been described by all the other workers in the area.

Q. Well, where did you observe it, that you could have observed it, except by possibly well logs, studying those? Or did you study them?

The Court: He has testified he didn't study well logs.

Mr. McPherson: Your Honor,——

The Witness: I have observed it in the field, and also the Division of Water Resources made a series of permeability tests on materials which were in the Fort Washington Terrace. And the permeabilities shown by those materials were much below [13,820] the permeability required for transmission of the

(Testimony of Robert T. Bean.)

amount of water in the size of aquifer to go to Fresno.

Q. (By Mr. Rowe): If you were trying to give the court an accurate example, why didn't you use the permeability you found in the 12 miles, instead of the 9 miles, if you wanted to give some sort of example?

Mr. Goldberg: I object, argumentative.

The Court: I don't understand the question.

Q. (By Mr. Rowe): If you were trying to give the court an accurate illustration of something, why didn't you use the facts? Why didn't you use the permeability of the material you claim to have a test on?

A. We will be very happy to do that, Mr. Rowe; and the reason is the aquifer width has to be much greater than four miles and much deeper than 100 feet to transmit—— [13,821]

* * * * *

Q. (By Mr. Rowe): What is the distance, say, between Palm Avenue intersection, with the bluff at Ledger Island?

The Court: Palm Avenue intersection of the San Joaquin River?

Mr. Rowe: With Ledger Island.

The Witness: Palm Avenue intersection with the river and Ledger Island? [13,822]

* * * * *

Mr. Goldberg: I don't see how he can get it anything but approximately, with that ruler.

The Witness: The bluffs seem to turn and twist

(Testimony of Robert T. Bean.)

a little more than the river. The distance is about 8½ miles. [13,823]

* * * * *

Q. (By Mr. Rowe): What is the total amount of sand in that well, the Pinedale?

A. The total amount of sand in the well marked "Camp Pinedale Well,"——

Q. I didn't say Camp Pinedale; I said well No. 12-20-32B.

A. It is 12-20-32B. It is simply marked "Camp Pinedale Well No. 3." [13,826]

* * * * *

The Court: The long and short of it is, there is 184 feet of sand and cobbles in the well?

The Witness: Sand, cobbles and float rock.

The Court: Which you considered permeable?

The Witness: I did.

Q. (By Mr. Rowe): Now, let's take well 12-20-32, out in [13,827] the Pinedale area.

A. 12-20-32; I have turned to it.

Do you wish me to add the sand in that?

Q. The sand, sand and gravel, cobbles, aquifers.

A. I get 157 feet.

Q. All right. Now going back to Well 12-20-32B, which you said had 184 feet of sand, sand and gravel, sand and cobbles, how deep was that well?

A. 300 feet.

Q. And 184 feet was the various sand, sand and gravel, and cobbles? A. Yes, sir. [13,828]

* * * * *

(Testimony of Robert T. Bean.)

Mr. Rowe: 12-20-32B.

* * * * *

The Court: He wants to know how much sand there is below the first 60-foot depth of the well.

The Witness: All right.

The Court: Regardless of the water.

The Witness: 170 feet. [13,829]

* * * * *

Q. Now, let's take well 12-20-26A. I believe it is located three-quarters of a mile upstream from Lanes Bridge. [13,832]

* * * * *

The Witness: It is 108. I made an error, I am sorry. The thickness is not given in this particular log here, and one must compute it, and it is hard to tell whether it is elevation or the depth of the top of the stratum or bottom of the stratum that is shown.

* * * * *

A. ——but approximately I would say it is about 2½ miles east southeast of the center of Lanes Bridge. [13,833]

* * * * *

Mr. Goldberg: It is at the corner of Alluvial and Fresno Avenue, owned by a man named Singh, S-i-n-g-h.

Mr. Rowe: Which is in that neighborhood. I will locate it on the map for you.

Q. This (indicating), on Plaintiffs' Exhibit 54, how much sand, cobbles, and sand-rocks and sand——

(Testimony of Robert T. Bean.)

The Court: That is Lee's well 140?

Mr. Rowe: Yes, sir.

The Court: From Exhibit 54?

Mr. Rowe: On Alluvial Avenue.

The Witness: If we include packed sand and rocks, and sand——

The Court: Everything that is sand or cobbles.

The Witness: The total is 128 feet. [13,835]

* * * * *

The Court: Give him the list of 10 wells. I would like [13,836] to know where they are, too. [13,837]

* * * * *

The Court: Let me see, you were to get for the well one-fourth mile east of the east quarter corner of Section 11, 12, 20, you gave the thickness of the permeable sands and gravel there as 128 feet, and were to get City Well 42, City Well 38 and City Well 39, also to get the surface elevation of the first well I mentioned and the depth to the first sand and the thickness of the sand below 60 feet.

Do you have those figures? [13,840]

* * * * *

The Court: There are two Papagni wells.

The Witness: This well was marked No. 1 on the sheet which I am reading, which is Exhibit 54-A.

Mr. Goldberg: Do you have the page on 54-A, Mr. Bean?

* * * * *

The Court: 123 foot thickness, he said.

Mr. Rowe: It isn't 128, is it?

The Witness: No, sir, it is not. [13,841]

* * * * *

(Testimony of Robert T. Bean.)

The Witness: The amount of sand and other permeable material below 60 feet would be 93 feet.

The Court: 93 feet?

The Witness: Yes, sir. [13,844]

Mr. Rowe: That was a well just opposite Ledger Island, which showed the gravel in the bottom was much deeper than that.

Mr. McPherson: What you are referring to is Exhibit 54-B, your Honor.

Mr. Goldberg: 54-A gives the locations of the well. We might be able to make a guess as to its sea level elevation on the U.S.G.S. quads.

The Witness: Yes, I believe we could get a reasonable approximation, your Honor.

The Court: What is the total depth of that well?

The Witness: 256 feet.

The Court: The well that I had in mind is Exhibit 54-B and that is known as the Diehl well?

Mr. Rowe: Isn't that about 147 feet deep?

The Court: That is 220 feet deep and it is located—I have a pencil note here—the west quarter corner of Section 1, Township 12 South, Range 20 East, completed about June 7, 1952. [13,845]

* * * * *

Mr. McPherson: If you get the transcript of record you will see on page 3773 that Mr. Lee testified that this well, City No. 42, was originally drilled to 570 feet and that it was cut back to 170 feet.

* * * * *

(Testimony of Robert T. Bean.)

The Court: What is the thickness of the permeable layer?

The Witness: The calculation I get from the one I had was 164 feet.

The Court: Does that correspond with your figures, Mr. [13,847] Rowe?

Mr. Rowe: Mine shows 172 even below the 60 foot level.

* * * * *

The Witness: All but two of those are below 60 feet. In other words, it would be 162 feet below the 60 foot depth. [13,848]

* * * * *

The Court: On Well No. 38, above 60 feet there is 7 feet of packed sand?

The Witness: Yes, sir.

The Court: So it is 90 feet below 60 feet?

The Witness: Yes, sir.

* * * * *

Q. (By Mr. Rowe): Now, Mr. Bean, could you give the average of those [13,851] wells, 38, 42, 39, 12-20-30B, 12-20-32, 12-20-26A, Lee 140, 12-20-11, 12-20-11R, and Lee 201. [13,852]

* * * * *

The Witness: I now have 10 wells listed here and I believe they are the same 10 wells so I will get an average.

The Court: 138 feet.

* * * * *

The Witness: 138.1 feet. [13,859]

* * * * *

(Testimony of Robert T. Bean.)

Mr. Rowe: 271 feet.

Q. If my figures are correct of 138 feet average depth of sand, gravel and cobbles, and the average depth of the wells is 277 feet, the amount of aquifer material in those wells is in excess slightly of 50 per cent, would it not be, if my figure of 271 as the average depth is correct?

A. Yes, it would indicate that. [13,861]

* * * * *

Q. (By Mr. Rowe): Now taking your assumption that you made and carrying it even to 9 miles that you assumed here, the total of 9 miles between Palm Avenue, if we have an average of sand of 130 feet between Palm Avenue, you said, and opposite Ledger Island was about 8½ miles, is it not?

A. If I so testified this morning, that is correct.

* * * * *

Q. Well, you said the sand strata was 100 feet high and four miles wide, which would produce under your assumption of 9 miles—I am not going to take the shorter distances, but just taking your assumption—what would an aquifer 100 feet deep and 8½ miles, how much would that produce?

The Court: 8½ miles wide?

Mr. Rowe: Yes, 8½ miles wide and a hundred feet deep.

The Court: It does not make any difference how long, assuming it is 9 miles? [13,863]

Mr. Rowe: I am taking his assumption at this time that it is 9 miles.

Mr. McPherson: What gradient? What head?

(Testimony of Robert T. Bean.)

Mr. Rowe: I am using his gradient, 9 miles, the same one he used, the same length of aquifer and the same gradient.

The Court: The same thickness but twice the width?

The Witness: That is the way I understand the question. The amount of water then per year would be 10,000 acre-feet per year. [13,864]

* * * * *

Q. Well, now, did you use the water level of the well at rest or while it was pumping?

A. Used the water surface as shown in the State ground water map to which you are pointing.

Q. And they test the wells after they stop pumping for a period, is that not true?

Mr. Goldberg: By "they," you mean the people who measure the wells for the State?

Mr. Rowe: Yes.

The Witness: Yes, I understand that is correct.

* * * * *

Q. Now, Mr. Bean, showing you Plaintiffs' Exhibit 66, showing the drawdown, average drawdown of wells in the San [13,871] Joaquin alluvial cone,——

Mr. Goldberg: That is 166, Mr. Rowe.

Q. (By Mr. Rowe): 166. That is 14 point what feet there?

A. Under "Pumping Drawdown, Feet," the average is given as 14.3.

Q. Now, as I understand you, in your testimony

(Testimony of Robert T. Bean.)

you assumed a drop between the river and the City of Fresno of 50 feet?

* * * * *

The Witness: In my computation of the hypothetical aquifer needed to carry the amount of water to Fresno indicated, I assumed that difference, yes. [13,872]

* * * * *

Q. Assuming 13,330 is coming in, then if you drop the level in Fresno 63.4 feet below your level that you took at Fort Washington Terrace.

A. Under the assumption that you have given me, the amount of water per year would be approximately 17,000 acre-feet.

Mr. McPherson: That is the total, or the increase?

The Witness: That is the total.

* * * * *

Q. (By Mr. Rowe): Yes, assuming 43 wells in the City of Fresno, which I believe is correct, and 9 are in the alluvial cone——

Mr. McPherson: Of the San Joaquin?

Q. (By Mr. Rowe): ——of the San Joaquin, and I believe the average gallonage pumped by the City of Fresno the last year was about 50,000 acre-feet? [13,874]

A. I understand that.

Q. How many acre-feet would 9/43 be? Let's put it that way.

The Court: Of 50,000?

Mr. Rowe: Of 50,000.

* * * * *

(Testimony of Robert T. Bean.)

Mr. Rowe: Well, let's get it.

The Witness: It is about 10,200.

Q. (By Mr. Rowe): And your other figure was 17,000 how much? A. 17,000.

Mr. Goldberg: How much was 9/43 of 50,000?

The Witness: About 10,200.

Q. (By Mr. Rowe): Then under my assumption that I have taken, of an [13,875] aquifer 8 miles wide, 133 feet deep, and with a drop in your grade of 63.4, there would be an excess capacity in that aquifer to take care of the 9/43 of the total of the City's pumping of some 7,000 acre-feet, wouldn't there?

The Court: Under those assumptions?

Mr. Rowe: Yes.

The Witness: Could I have the question again, Mrs. Buck?

(Question read.)

The Witness: To take care of the portion of the City's pumping on those 9 wells?

Mr. Rowe: From the alluvial cone.

The Witness: That is correct, if you consider them 9/43 of the total.

The Court: In other words, assume the 9 wells produce about 9,000 acre-feet for the City, there would be about 7,000 acre-feet excessive?

The Witness: That is correct, according to those assumptions. [13,876]

* * * * *

Q. (By Mr. Rowe): I will ask you if you know whether the original bottom of that well was an

(Testimony of Robert T. Bean.)

open bottom ending in a sand strata below the last clay shown?

A. Naturally I do not know, because I was not there when the driller drilled it. However, my original statement, which I made on direct, stands, that drillers ordinarily like to bottom a well in clay, simply because it is a better place [13,883] to seat the casing.

* * * * *

Q. (By Mr. Rowe): Whether they like to or not, isn't it a fact that every well in the San Joaquin alluvial cone is known as an open bottom well?

The Court: And bottomed in what?

Mr. Rowe: Sand; the casing is landed on clay so it doesn't fall through, but bottomed in sand, gravel, or cobbles?

The Court: With an open bottom? [13,884]

Mr. Rowe: Yes.

The Witness: I would say from the evidence of the well logs the answer is no, because there are a number of them bottomed in clay. [13,885]

* * * * *

Mr. Rowe: Well, it shows it is cased down to where you hit the clay. They don't case it after they hit clay. They drill through that clay.

Q. That well, if you would measure it, is over 200 feet to the bottom, is it not?

Mr. McPherson: Well 39?

Mr. Rowe: 39. [13,887]

* * * * *

(Testimony of Robert T. Bean.)

Q. Well, in other words, if it was a confined aquifer pumping from 200 feet, the slope from the river, on your assumption would be increased roughly three times, would it not?

A. The slope is determined by the piezometric head or the pressure head or the water level in the well, not by the location of where the stratum is below the surface.

Q. Well, your illustration shows there was sufficient capacity, was there not, of these aquifers to carry it?

Now, if the aquifer slopes three times what you assumed, it has the ability to carry three times 17,000, does it not, if they are open bottom wells? I don't say the water level is up, but it has that capacity, does it not?

A. It most certainly does not. [13,888]

* * * * *

The Witness: Gravel as ordinarily used, Mr. Rowe, includes cobbles. It can even include boulders.

Mr. Rowe: You wouldn't want to contradict Mr. Gardner, would you? [13894]

Q. Isn't gravel any stone up to two inches in size? A. That is not my understanding.

Q. And isn't a cobble anything from two inches to ten inches?

A. A cobble size is approximately two to ten or eleven inches in diameter, but cobbles are part of gravel.

(Testimony of Robert T. Bean.)

Q. But isn't gravel considered from about a quarter of an inch to two inches?

A. Not according to my understanding.

Q. You do state, though, that cobbles are from two inches up to about eleven when you talk of cobbles?

A. Approximately.

Q. Well, assume for the moment that cobbles and gravel have a coefficient of permeability of the largest amount found under gravel, 20,663, then they would have ten times, roughly, the coefficient of permeability of the figure that you used, wouldn't they?

A. Under your assumption, that is correct.

* * * * * [13,895]

LELAND K. HILL

recalled as a witness, having been previously duly sworn, was examined and testified further as follows: [13,966]

* * * * *

Mr. McPherson: We have handed already Mr. Rowe, and I believe the court, the requisite number of copies of the summary prepared by the witness Hill entitled "Summary of Canal Side Deliveries to Madera and Friant-Kern Service Areas From Millerton Lake, Limited to Canal Capacity."

Q. Is that correct?

A. That is correct. Also the court has a copy.

The Court: Just a moment, now. The court did have a copy.

(Testimony of Leland K. Hill.)

Mr. McPherson: I ask that this summary be received in [13,979] evidence as this witness' direct testimony on the subject matter contained within it under the stipulation that is you interrogated him separately he would answer and testify as set forth in this narrative.

The Court: Yes, I remember seeing this. This will be the next in order, A-13-A.

(The document referred to was marked Defendants' Exhibit A-13-A for identification.)

The Clerk: Admitted in evidence?

The Court: Admitted in evidence as being this witness' direct testimony under the stipulation.

(Reporter's Note: The exhibit above referred to is physically inserted in the transcript herewith:) [13,980]

DEFENDANTS' EXHIBIT A-13-A

United States Department of the Interior, Bureau of Reclamation, Regional Office, Region 2, P. O. Box 2511, Sacramento, California.

Summary of canal side deliveries to Madera and Friant-Kern service areas from Millerton Lake, limited to canal capacity.

L. K. Hill, Regional Water Rights Engineer, May 16, 1952. [13,981]

Two tabulations, one for the Madera canal and the other for the Friant-Kern canal, are the results of a study made by personnel of the Bureau of Reclamation, at Fresno, and dated December 1951,

(Testimony of Leland K. Hill.)

Defendants' Exhibit A-13-A—(Continued)

to determine the maximum quantity of Millerton Lake water that could have been available for delivery through the Madera canal and Friant-Kern canal during a 53-year period using similar hydrologic conditions that prevailed during the period 1897 through 1949. This maximum quantity of canal side deliveries was limited by the estimated quantity of water available in Millerton Lake after downstream riparian water uses were satisfied, the intake capacities of the two canals, the monthly demands for Class 1 and Class 2 water and the percolation and operational losses of the canals. For the purpose of this study no deliveries of Class 1 water would be made in [13,982] December, January, and February; no delivery of Class 2 water would be made in August, September, October, and November, and Class 2 releases in December, January, and February would only be made to meet reservoir flood control criteria.

Class 1 water is that supply of water at Friant Dam and Reservoir available after downstream riparian uses are satisfied which, subject to contingencies concerning certain allowable deficiencies, will be available for delivery from the Madera and Friant-Kern canals as a dependable water supply, but not to exceed 750,000 acre-feet canal side delivery in any irrigation season. For this study the maximum allowable deficiency did not exceed 36% of the Class 1 supply (canal side delivery) on an average of once in 25 years, and did not exceed

(Testimony of Leland K. Hill.)

Defendants' Exhibit A-13-A—(Continued)

46% of Class 1 supply on an average of once in 50 years.

Class 2 water is that supply of water which becomes available in addition to the supply of Class 1 water and which, because of its uncertainty as to availability and time of occurrence, will be undependable in character and will be furnished only if, as, and when said water is available as determined by the United States.

For the 53-year period, the maximum total annual quantity (canal side delivery) of water in the canals would have occurred in the year 1906 with 2,558,000 acre-feet of which 750,000 acre-feet was Class 1 and 1,808,000 acre-feet was Class 2 water. [13,983] Madera canal delivery totaled 567,300 acre-feet of which 140,000 acre-feet was Class 1 and 427,300 acre-feet was Class 2 water. Friant-Kern canal delivery totaled 1,990,700 acre-feet of which 610,000 acre-feet, was Class 1 and 1,380,700 acre-feet was Class 2 water.

The 53-year average annual delivery of water in both canals totaled 1,457,400 acre-feet of which 735,000 acre-feet was Class 1 and 722,400 acre-feet was Class 2 water. Madera canal delivery averaged 308,400 acre-feet of which 137,100 acre-feet was Class 1 and 171,300 acre-feet was Class 2 water. Friant-Kern canal delivery averaged 1,149,000 acre-feet of which 597,900 acre-feet was Class 1 and 551,100 acre-feet was Class 2 water.

Minimum delivery of water occurred in 1931 with

(Testimony of Leland K. Hill.)

Defendants' Exhibit A-13-A—(Continued)

a total of 408,700 acre-feet all of which was Class 1 water. Madera canal delivery was 76,300 acre-feet and Friant-Kern delivery was 332,400 acre-feet.

The full supply of Class 1 water, 750,000 acre-feet was delivered in all years except the five extremely dry years: 1924, 1929, 1930, 1931, and 1934. No Class 2 water was delivered in six years: 1913, 1924, 1929, 1930, 1931, and 1934. [13,984]

(Testimony of Leland K. Hill.)

The Court: Where do you get this figure on your A-13-A? Is that based upon 520,000 acre-feet storage at Friant?

The Witness: That 520,000 plus, your Honor, is the gross capacity of Millerton Lake.

The Court: Where did you get your figure of 750,000 acre-feet of Class 1 and 1,400,000 acre-feet of Class 2 water? Where do those figures come from?

The Witness: Those figures, your Honor, are determined by trial and error of making a study similar to what you see in front of you there. From such a study of the operation of the reservoir with the available water in the river and the canal capacities, one is able to determine what the firm supply will be or a dependable supply which is referred to as the Class 1 water. And from these studies it is ascertained that a maximum of 750,000 acre-feet of water can be obtained as canal side delivery, delivery now from the canals to the irrigators, or the irrigation districts rather.

Now that 750,000 acre-feet of Class 1 water in some years would have to take a deficiency. In other words, there is not a supply for every year of 750,000 acre-feet, but in most years there is such a supply. Then any water over and above that supply is the Class 2 water, and that is used also in connection with the Class 1 water. [14,001]

* * * * *

Q. (By Mr. McPherson): Then as I understand it from your last answer to the court's question, the

(Testimony of Leland K. Hill.)

obligation as it is understood and the plan proposed by these defendants is that the rights and demands to the water from the San Joaquin River of the diverters on the stream between Friant and Gravelly Ford will be met first before any diversion is made at Friant? A. That is correct.

* * * * * [14,677]

The Witness: I don't see that it is, your Honor, that it is desirable. However, it may be desirable for all concerned, until the defendants' plan has been given a test for a number of years to see if it will work, that such a man should be employed for just that service. [14,690]

* * * * *

Mr. McPherson: I refer the court particularly to lines 24 to 29 at page 3 of Exhibit B, which reads:

"If, after a reasonable period of operation under this plan it should develop that surface diversions cannot be efficiently made by pumps and/or if the water table should substantially fall as the result of the control flow of the river and it should be determined that additional dams or check dams will overcome its deficiency, then such as are necessary should be installed."

Q. Is that your opinion?

A. That is. [14,830]

* * * * *

Q. * * *, where in your opinion is the site and location on the reach of the river between Friant

(Testimony of Leland K. Hill.)

and Gravelly Ford where the necessity for the installation of a check dam is likely to first occur?

The Court: To first occur?

Mr. McPherson: To first occur.

The Witness: That would be very difficult to answer because there is two conditions, as I visualize it, on the river that may necessitate construction of a check dam.

Q. (By Mr. McPherson): What are those two conditions?

A. First in the upstream stretch of the river you are going to have erosion, cutting down of the river channel in the bottom. That cutting will take place at some of the [14,850] natural bars that now exist, such as the one we described at Rank Island. That may cut out. Or some other bar upstream or downstream from Rank Island, which would lower the water surface to an extent that the present pumps along the river would not function. Because of the cutting of the channel bed at some of the natural existing bars it would necessitate a check dam.

The other condition would be below Lanes Bridge and particularly below Herndon where the channel bed is shifting with the change in flow, sand and gravel shifting back and forth across the channel, and with low flows you may find that the stream channel would be on the opposite side of the river from where a pump may be installed.

The Court: It may shift?

The Witness: It may shift; that is correct.

And a check dam would serve a function in such

(Testimony of Leland K. Hill.)

a location to keep the water level at a more uniform or constant level across that stream, or it may be that the check dam would provide for a low section on one end or the other in order for the channel to flow to the low end of the control to provide water, say, at a given bank where a pump would be located. [14,851]

* * * * *

Now from Lanes Bridge to Herndon and below Herndon the river bed is quite wide and with small flows you could find all of the water on one side or the other, and this shifting back and forth of the channel, probably a check dam would be worthwhile to install, [14,852] * * * * *

Q. (By Mr. McPherson): I ask you to indicate the upstream limits of the area where the shifting sands, for physical reasons, might warrant the construction of check dams; and I ask you to indicate that on A-9-A-1.

* * * * *

The Witness: I would say it would be in the vicinity of Lanes Bridge, where there would be a change. I think we could use Lanes Bridge, or right close in that vicinity. [14853]

* * * * *

The Witness: Well, if I were ordered to build one right now, I would select site No. 4 of both the State and the plaintiffs.

Q. (By Mr. McPherson): Is that, in your opinion, the point of necessity for one, where the shifting would first occur?

(Testimony of Leland K. Hill.)

A. With conditions as they are today, probably yes. [14,855]

* * * * *

Q. With reference to the degradation, which you say is likely to occur, where is the factor of degradation most likely, in your opinion, to be such as would warrant or call for the installation of a check dam?

A. I would say at Cobb's Ford, at Rank Island. And the reason I would select that is to protect our own interests. We have already constructed and placed the control barrier.

Q. That is only in the event Cobb's Ford is washed out or were eroded down to where it is not practical to continue with fill, as you described?

A. Yes. [14,856]

* * * * *

The Court: At both 3 and 4 there is a possibility there may be a shifting and erosion of the gravel bar?

The Witness: At three there is a possibility of erosion there. There is not likely to be a great deal of shifting.

At 4, it is going to be one of shifting. I doubt very much there will be any erosion take place there.

The Court: And in the event of shifting, it may become necessary to build a check dam?

The Witness: From a physical standpoint, it might warrant it. From an economical standpoint, it doesn't warrant it. [14,861]

* * * * *

(Testimony of Leland K. Hill.)

The Witness: No. 5, your Honor, there is considerable shifting in the river channel and particularly just upstream from No. 5.

The Court: Munson Island?

The Witness: At Munson Island, yes, your Honor, at the mouth of the island. There is considerable shifting of sand in that locality.

Mr. Goldberg: By "No. 5" you mean plaintiffs' 5?

The Witness: Plaintiffs' 5. [14,862]

* * * * *

The Court: This is A-26-A, the narrative, and A-26-A-1 is the drawing.

(The documents referred to were marked Defendants' Exhibits A-26-A and A-26-A-1 for identification.)

The Court: Will you now explain the drawing.

Mr. McPherson: Let's get our record straight, your Honor.

In view of Mr. Rowe's statement, it is stipulated that the narrative description of the Bureau of Reclamation check dams for possible use on the San Joaquin River between Friant and Gravelly Ford, which is marked A-26-A, shall be received in evidence as this witness' direct testimony, being a description of A-26-A-1.

Mr. Rowe: Subject to——

Mr. McPherson: Subject to the objection to the witness' qualifications.

Mr. Rowe: Subject to objection——

(Testimony of Leland K. Hill.)

The Court: It should be placed by the reporter in the transcript, as were the others.

Mr. McPherson: That is correct.

The Court: Have you mimeographed copies?

A-26-A is the narrative, and A-26-A-1 is the sketch accompanying the narrative. They will both go into the record.

(The documents referred to were received in evidence and marked A-26-A and A-26-A-1.)

Mr. McPherson: No, we don't have copies. We will have to have the reporter transcribe this into the record.

The Court: All right.

(The exhibit referred to is in words and figures as follows, to-wit:) [14,871]

DEFENDANTS' EXHIBIT A-26-A

United States Department of the Interior
Bureau of Reclamation
Regional Office, Region 2
Sacramento, California

Description of United States Bureau of Reclamation check dams for possible use on San Joaquin River between Friant and Gravelly Ford.

L. K. Hill, Regional Water Rights Engineer
January 14, 1953

The purpose of the check dams is to control and stabilize the vertical gradient of the stream bed. This objective would be accomplished by the use

(Testimony of Leland K. Hill.)

Plaintiff's Exhibit A-26-A—(Continued)

of rock riprap and two rows of interlocking steel sheeting. The upper row of sheeting, which forms a weir crest, would extend vertically approximately 18 inches above the existing contour of the stream bed. Laterally the row of sheeting would extend up the side slopes of the banks, a reasonable distance to stabilize the bank, and for cost estimating purposes a distance of 16 sheets or 18 feet, 8 inches, was used. The steel sheets on the banks would be driven approximately flush with the surface of the side slopes so as to be covered with rock riprap. All sheets in the upper row across the stream bed and up the side slopes [14,873] would be 18 feet long, No. 7 U. S. Standard Gage (0.1793 inches thick) or heavier, galvanized, corrugated, interlocking steel sheeting. Thirty feet downstream from the weir crest a toe wall consisting of interlocking sheeting, six feet long and driven flush with the stream bed, would stabilize the rock riprap, preventing it from being washed downstream during high water flows. The toe wall would extend approximately seven feet up the banks beyond the toe of the side slopes. In structures of this type the rock riprap would prevent undercutting along the sheeting, and provide a flexible apron and also assist in the stabilization of the channel gradient.

The riprap in the stream bed and part-way up the side slopes would be 36 inches thick with individual rocks varying in size from 12 to 36 inches in diameter. The assortment of sizes would provide

(Testimony of Leland K. Hill.)

Plaintiff's Exhibit A-26-A—(Continued)

a semi-interlocking effect, which would help to prevent downstream movement. This heavy riprap would be used for a distance of 40 feet downstream from the upper row of sheeting. Riprap, 12 inches thick, would be continued up the sides to a vertical height of about ten feet above the river bed on a 2:1 slope. Riprap, 12 inches thick, would also cover the banks upstream for a distance of about ten feet from the weir crest. Riprap would be piled against the upstream face of the weir sheeting for a distance of three or four feet. Riprap below the weir would be laid on a gravel blanket, at least six inches in thickness, provided the river [14,874] bed material was not suitable for this purpose.

The estimated cost of a typical check dam has been prepared on the basis of cost per lineal foot for the two rows of sheeting plus the riprap in the stream bed and lump-sum estimate for the side sections complete with the sheeting and riprap. With such a breakdown an approximate cost for any width of stream channel can be obtained by adding the lump-sum cost of the side sections to the unit cost per foot of weir section multiplied by the width of the stream bed.

The estimated cost of such typical check dams would range from about $37,000 for a weir crest length of 160 feet to about $79,000 for a crest length of 390 feet. A cost breakdown by items for a typical check dam is given in Table 1. The estimated costs of such check dams for various weir crest are given in Table 2. [14,875]

(Testimony of Leland K. Hill.)

Plaintiff's Exhibit A-26-A—(Continued)

Table 1—Estimate of Cost of a Typical Check Dam

Unit costs:		
18 foot sheet piling in place	$ 5.00	per square foot
18 foot piles in place	90.00	per lineal foot of dam width
6 foot piles in place	4.00	per square foot
6 foot piles in place	24.00	per lineal foot
Dump riprap	6.00	per cubic yard
Gravel blanket	2.00	per cubic yard
Excavation	0.50	per cubic yard

Lump sum estimate for bank construction—2 sides:	
18 foot piling—37.34 feet at $90.00 per lineal foot	$ 3,360.60
6 foot piling—14 feet at $24.00 per lineal foot	336.00
Excavation—60 cubic yards at $0.50	30.00
Riprap—121 cubic yards at $6.00 per cubic yard	726.00
Gravel blanket—8 cubic yds. at $2.00 per cubic yd.	16.00
Clearing	50.00
	$ 4,518.60

(Use—$4,500.00)

River bed construction—per lineal foot of width:	
18 foot piling	$ 90.00
6 foot piling	24.00
Excavation—4 cubic yards at $0.50	2.00
Riprap—5 cubic yards at $6.00	30.00
Gravel blanket—0.74 cubic yards at $2.00	1.50
	$ 147.50

(Use—$150.00)

Estimated cost of check dam at Plaintiff's No. 5 site:	
Bank section	$ 4,500.00
River bed section—390 feet at $150	58,500.00
Engineering, administration and contingencies 25%	15,750.00
	$78,750.00

(Use—$78,800.00)

(Testimony of Leland K. Hill.)

Plaintiff's Exhibit A-26-A—(Continued)

Table 2—Estimated Cost of Typical Check Dams for Various Weir Crest Lengths

Weir crest length (a)	Bank section	River bed section	Engineering, administration & contingencies (25%)	Total
Feet	$	$	$	$
160	4,500	24,000	7,125	35,625
220	4,500	33,000	9,375	46,875
376	4,500	56,400	15,225	76,125
360	4,500	54,000	14,625	73,125
322	4,500	48,300	13,200	66,000
390	4,500	58,500	15,750	78,750

(a) The weir crest lengths correspond with the locations of the proposed five state dams and Plaintiff's No. 5 dam, respectively.

Systematic or routine maintenance of structures of the typical check dams considered is not anticipated. Additional riprap, however, might be needed following river discharges of unusual magnitude, which is possible but not anticipated with careful regulation of flow releases from Friant Dam. Likewise, degradation of the river channel below a check dam might call for additional rock. It seems desirable, therefore, to provide an estimate of cost for such contingencies, even though it is difficult to estimate the probable average annual cost. For the purpose of this estimate it is assumed that an additional amount of riprap equivalent to fifty per cent of the original volume might be added over a period of twenty years. On this basis, the average annual cost for maintenance would be about $2,500 for the five sites selected by the State, and $625 for the Plaintiff's No. 5 site. [14,878]

* * * * *

(Testimony of Leland K. Hill.)

Q. (By Mr. McPherson): What in your opinion, Mr. Hill, would be a fair operation and maintenance estimate on the defendants' plan of physical solution without the installation of any dams, either of the type proposed by the plaintiffs, the State, or the suggestion made by you? In other words, operation and maintenance on the plan of physical solution as proposed by the named defendants.

The Court: Without the dams?

Mr. McPherson: Without the dams. [14,928]

The Witness: That will cost, I would say, between about $12,000 and $13,000 a year to maintain and keep up the river. That would involve——

The Court: Would that cost be eliminated by the construction of these dams?

Mr. McPherson: I was just coming to that.

The Witness: No, your Honor, it would not.

The Court: I did not understand his question, then. It would not?

The Witness: It would not.

The Court: It would not?

The Witness: No, your Honor.

Q. (By Mr. McPherson): In other words, that operation and maintenance estimate would be constant irrespective of whether any dams were built or not, or how many dams were built?

A. That is correct. [14,929]

* * * * *

The Court: Let us say then 25 second-feet in

(Testimony of Leland K. Hill.)

January would be in your opinion the maximum requirement for release in January?

The Witness: Yes. You can say 18 to 25.

The Court: In February?

The Witness: Well, in February it would be about the same. It may be as much as 30.

The Court: Let us say 30.

The Witness: All right, 30.

Mr. Rowe: What exhibit is that of Mr. Lee's?

The Court: 116.

In March?

The Witness: 65.

The Court: Why does it go up?

The Witness: Greater demand beginning in March. You have more evaporation, you have more evapo-transpiration, and [14,978] not only that but the latter part of March some irrigation starts along the river.

The Court: These releases here are based on the assumption that the direct diversions from the river and demands upon it are the same as exist today or approximately the same?

The Witness: Yes, we can consider it as such.

I have been including in this estimate from 50,000 to 65,000 that it would be for the ultimate conditions. That would be a development greater than what is there now.

Mr. Child: As I understand it, these are demands, not releases.

The Witness: These are demands.

(Testimony of Leland K. Hill.)

The Court: Demands, or call them anything you want.

The Witness: They are demands and the release would have to be made if there was no inflow into the river.

Mr. Child: That is right.

The Court: April?

The Witness: About 65.

The Court: May?

The Witness: Around 105.

The Court: June?

The Witness: About 135.

The Court: July?

The Witness: About 170 or 175.

The Court: 175? [14,979]

The Witness: All right.

The Court: August?

The Witness: Around 155.

The Court: September?

The Witness: About 105.

The Court: Where does this maximum of 350 come in?

The Witness: That may be in some dry years, your Honor. You may have temperatures of 112 and 115 degrees and if we do why the more the evaporation. I am speaking now of an average condition.

The Court: October?

The Witness: 45.

The Court: November?

The Witness: 25 and December 25.

(Testimony of Leland K. Hill.)

The Court: Now what does that total?

Mr. Rowe: December is 25 too?

The Witness: Yes.

Well, it will total right close to 80 second-feet on the average.

The Court: How many acre-feet? Let us translate that into acre-feet.

The Witness: Close to 60,000 acre feet.

The Court: Now that is what you propose to release under the submitted plan of operation?

The Witness: No, sir, we do not propose to release that. [14,980] We propose to release whatever the requirement is regardless of this. This is an estimate I have made of what we can expect.

The Court: The requirements to be?

The Witness: Yes.

Mr. Goldberg: But if the requirements turn out to be more you will release more?

The Witness: If it is more we will release whatever it takes.

The Court: So that this is the release that could be expected to be made under your plan of operation?

The Witness: Yes, your Honor. [14,981]

* * * * *

The Court: And then assume that these gates are raised on the 1st of May in a normal runoff year for these figures [14,982] and dropped on November 15th, the quantities which you have recommended here, stated which you believe to be that which you would recommend, releases for from

(Testimony of Leland K. Hill.)

April to May would fill all of the ponds to the levels and maintain them as recommended by Mr. Lee in your opinion?

The Witness: Well, no, we would have to release a little bit more because of the additional evaporation.

Mr. Rowe: That is 10,000 acre-feet?

The Court: 24 second-feet.

The Witness: 24-second feet.

The Court: Plus 24 second-feet.

The Witness: Yes, on an average.

The Court: On an average?

The Witness: Yes. That would probably range from 10 second-feet up to about 40 second-feet with an average of about 24.

The Court: That would be a total release then of 70,000 acre-feet?

The Witness: Yes, your Honor, an additional 10,000 acre-feet of water would be required then.

* * * * *

Cross Examination * * * * *

Q. (By Mr. Rowe): How much surface in addition to the underground pumping would you say?

The Court: 150,000 acre feet of water?

Mr. McPherson: 130,000, he said.

The Court: 130,000?

The Witness: Yes, your Honor.

Probably from the underground they could have a dependable supply that would be around 30,000

(Testimony of Leland K. Hill.)

acre-feet, and the rest would have to come from surface. [15,610]"

* * * * *

The Witness: Your Honor, the operation studies that have been made for the water supply and as they were originally presented to the various irrigation districts included Class 1 water in an amount of 800,000 acre-feet and the United States can contract Class 1 water up to that quantity without infringing upon the water supply from the project to the various districts that we now have contracts with or contemplate contracting with. There is approximately 50,000 acre-feet of water that could be made available.

The Court: Where?

The Witness: Between 750,000 and 800,000.

Mr. McPherson: He means physically where.

The Court: Yes.

The Witness: In Millerton Lake, your Honor.

* * * * *

Q. So over 50 years, as I understand you, Fresno could safely pump an additional 30,000 acre-feet from what they are doing now, from the underground?

The Court: He didn't say that. He said they could safely have a supply underground of 30,000, and would need another 100,000 acre-feet.

Q. (By Mr. Rowe): Need another 100,000 acre-feet from another source?

A. That is correct. [15,613]

* * * * *

(Testimony of Leland K. Hill.)

That would cost, to bring the water in from the Friant-Kern Canal to the City, between six and seven million dollars. My estimate was $6,705,000.

For a similar pipeline from Pinedale to the City would be $2,340,000. Oh, I beg your pardon, that would be the pipeline. It would have to have the diversion structure and pumping plant, which would be $1,740,000, or a total of $4,080,000 for the line from Pinedale.

Now, putting it on an annual basis, an annual cost, the Friant-Kern Canal line to the City would be about $335,000 annually.

Q. How many years?

A. And from the San Joaquin——

The Court: How many years?

The Witness: That would be using the 50-years, your Honor, depreciation over 50 years.

The Court: How far did you say it would be from Friant Dam?

The Witness: Not from Friant Dam; from the Friant-Kern Canal, 12.7 miles to the City.

The Court: Where would that take off?

The Witness: From the City? [15,618]

The Court: No, from Friant-Kern Canal. Up where that diversion works is, and the little dry reservoir we couldn't find?

The Witness: Your Honor, the line would extend from the city, about the center of the city, out—it would be north of the Fresno air terminal —what do you call it, Hamilton Field?

Mr. Rowe: Hammer Field.

(Testimony of Leland K. Hill.)

The Witness: Hammer Field. Would go in a northwesterly direction toward Clovis——

The Court: Northeasterly.

The Witness: Northeasterly, yes, to Clovis, the city limits of Clovis, would go about a mile and a half north along the east boundary of the city, then in a northeasterly direction from there right up to the Friant-Kern Canal.

The Court: Where in the Friant-Kern Canal? How many miles——

The Witness: That would be approximately——

The Court: What township and range? You have it there in your map.

The Witness: It would be in Section 19 of Range 22 East, Township 12 South.

The Court: That would be northeast of Sanger several miles, or north of Sanger?

Mr. Rowe: Not Sanger. [15,619]

The Witness: Northeast of Clovis.

The Court: Northeast of Clovis?

The Witness: Yes.

The Court: And north of Sanger?

The Witness: Yes, it would.

The Court: About 10 miles?

The Witness: Well, I don't have Sanger on my little map here. I don't know just how far it would be.

The Court: How much head would there be at Pinedale?

The Witness: Well, there would be no head at Pinedale, your Honor. You have to pump it out

(Testimony of Leland K. Hill.)

of the river into the conduit, and pump it into the system.

The Court: After it gets out at Pinedale, would there be any head between Pinedale and the City of Fresno?

The Witness: Yes, there would be some head.

The Court: But you have to pump it?

The Witness: Yes.

The Court: You have a head of 120 feet at Friant-Kern Canal?

The Witness: Sufficient for that, yes.

The Court: What head would you have if it were taken out of Friant?

Mr. McPherson: Out of the dam itself?

The Court: Out of the dam itself. [15,620]

The Witness: It would be higher than the canal. There is a drop in the canal, in that distance.

Not only that. You would have the pressure, whatever the stage would be in the reservoir. There would be additional pressure at times.

That was one of the points the City was very much interested in, was to obtain the head for their fire system, by using Millerton Lake.

What it would cost to bring the water from Friant Dam, I have not made such a study, because I had hoped the City would make their study, and when we sat down at the table to negotiate a plan, they would present studies they had made, and we would present studies.

Q. (By Mr. Rowe): What is the annual cost at Pinedale? A. 200,000.

(Testimony of Leland K. Hill.)

Q. 200,000 a year? A. Yes. [15,621]

* * * * *

Q. Turning to A-17-A—that is raising Friant Dam 60 feet—and turning to page 13, to page 13, "Annual Costs," where you reach the amortization charge of $984,000—and if I may mark this for identification 218 of the plaintiffs. [15,865]

* * * * *

The Court: "The larger reservoir could produce an average of about 93,400 acre-feet annually of class 1 water at the reservoir outlets more than the existing reservoir."

Mr. McPherson: That is right. [15,908]

* * * * *

Q. Now, at page 15,259, you said the flood control benefits—that is January 29th, I believe, according to my notes here—of Friant Dam were $9,549,000 of your total cost of $22,007,000, isn't that true? In other words, that was allocated to Friant for flood control?

The Witness: It was nine million plus. I don't just remember your last figures. The figure you gave doesn't sound just right.

Mr. McPherson: What page?

Mr. Rowe: 15,259.

The Witness: Whatever I gave—I would have to check it. I know it is nine million plus. I thought there was an 11 on the end of it.

Mr. McPherson: On that page the witness stated:

"On the basis of $22,007,000, with the flood control allocation of $9,211,000, the residual would be

(Testimony of Leland K. Hill.)

$12,796,000, which would be a charge to irrigation."

The Witness: That is correct.

Q. (By Mr. Rowe): Now, if you take the same percentage you allocated [15,928] to Friant Dam for flood control—would you give that percentage, Mr. Hill, the percentage that was allocated to flood control, of the total cost of Friant Dam? Or, putting it this way, what percentage was allocated to irrigation, that is, chargeable to irrigation at Friant Dam?

A. Well, the estimated cost is $22,007,000, and allocated to flood control was $9,211,000. And taking $9,211,000, divided by 22 million plus, you get the percentage, which is slightly under 42 per cent of the cost, which was allocated to flood control.

* * * * *

Mr. Goldberg: It is a conclusion on a conclusion.

The Court: Objection sustained.

Mr. Hill, having reference again to the State plan of physical solution, plate 4B, he states the yearly mean to be 95 second-feet.

How many acre-feet would that be, a yearly mean of 95 second-feet?

The Witness: It would be 69,000 acre-feet, your Honor.

The Court: 69,000 acre-feet? [15,952]

* * * * *

The Court: Having reference to your A-10-A, table 2C and 3, pages 18 and 20—do you want to follow this, Mr. Rowe?

Mr. Rowe: Yes.

(Testimony of Leland K. Hill.)

The Court: Why don't you get A-10-A? [15,953]

* * * * *

The Court: In your opinion, would the release of 60,000 acre-feet down the river, under Mr. Lee's plan, satisfy the requirements, the ultimate requirements that you have set forth in table 2C and in table 6?

The Witness: Under full development of the project, yes.

* * * * *

The Court: I understood your previous answer —and that was the purpose of my question, and I want you to be sure you understand my question —my question was, and I will ask it again, would the release of 60,000 acre-feet annually under Mr. [15,955] Lee's plan of physical solution, which you say is the total sum required to satisfy it, is that right?

The Witness: Yes, satisfy that area under full development.

The Court: Under full development?

The Witness: Yes, your Honor. [15,956]

* * * * *

Q. If the court ordered Mr. Lee's plan adopted and that the Bureau keep the ponds full and 10 second-feet at the last dam, as far as water is concerned——

The Court: Now, Mr. Rowe, just suppose that you leave out the proposition of the court ordering. Why not ask a question in a lawyer-like way

(Testimony of Leland K. Hill.)

and say, assume that the 14 dams were built under Mr. Lee's plan——

Mr. Rowe: All right.

The Court: ——and 10 second-feet over the last dam. Now what was your question?

Mr. Rowe: Over the last dam, they would only take 10,000 additional feet more water than the defendant Bureau's plan or Officials plan of operation, isn't that right?

The Court: That has been asked and answered half a dozen times.

Mr. Rowe: But I want to ask the last one.

Q. Is that not true? [15,960]

The Court: It would take the difference between 48,400 and 60,000 acre-feet, would it not?

Mr. Rowe: No, he said it would take a little more than that.

The Witness: I said it would take around 50,000 for the Bureau's plan on the average.

The Court: For the Bureau's plan?

The Witness: Yes. I have raised that 48,000 up a little, your Honor.

Q. (By Mr. Rowe): So as far as the water is concerned, whether Mr. Lee's plan goes into operation or yours, there is only going to be an amount of 10,000 acre-feet a year difference to go down the river?

A. That would be correct, to satisfy the needs of the stream, in my opinion. [15,961]

* * * * *

HARRY BARNES

called as a witness by and on behalf of the defendants, having been first duly sworn, was examined and testified as follows: [16,096]

* * * * *

The Court: You said that in your opinion 200 second-feet seeps continuously, or 400 acre-feet, per day, between Friant and Gravelly Ford.

The Witness: Yes.

The Court: Regardless of the flow of the river?

The Witness: I think so. [16,228]

* * * * *

Mr. Rowe: For the purposes of the record, elaborating a statement I made, I have no desire to see the Department of the Interior step into this lawsuit and, on behalf of my clients and also the City of Fresno, they would like a decision in this matter, and we might express our views.

Mr. McPherson: Then I have been laboring under a misapprehension all this time. I thought the court was up here to make a decision.

Mr. Rowe: I mean if anybody should go back to Washington we would just express our opinions of the personnel of the Bureau possibly and their policies.

The Court: I have nothing to do with that. I have expressed myself on the record as to my views and I do not wish to be drawn into any discussion which involved anybody's political views or anything else. I am here to try a lawsuit. If the United States wants to become a party, fine

(Testimony of Harry Barnes.)

and dandy; if they do not and you want to make a motion, I will rule on it. [16,294]

* * * * *

Q. The court asked you:

"The Court: Do you have an opinion as to the amount of water that seeps between Friant and Mendota?

"The Witness: (Making calculation) 292 second-feet.

"The Court: In other words, an additional 92 second-feet?

"The Witness: That is correct."

Now, that question was asked you by the court, and you gave that answer, didn't you?

A. I did.

Q. How many acre-feet per year will 292 second-feet seeping continuously produce?

A. 211,000 acre-feet.

Q. 211,000? A. Yes. [16,974]

* * * * *

CHARLES H. SORTOR

called as a witness by and on behalf of the plaintiffs, having first been duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Charles H. Sortor, S-o-r-t-o-r.

* * * * *

Direct Examination

Q. (By Mr. Rowe): How long have you lived in the San Joaquin Valley and Fresno, Mr. Sortor?

(Testimony of Charles H. Sortor.)

A. Since 1905 or '06.

Q. And are you an engineer, and if so tell us what.

A. Yes, sir. I am a registered professional engineer of the State of California.

* * * * *

Q. And how many pumps within the San Joaquin Valley have been installed under organizations that you have managed [18,018] in the San Joaquin Valley?

A. During my time of service with those organizations, I would say about 10,000.

Q. Do they cover the entire area——

The Court: You mean installed that many pumps?

The Witness: Yes, sir.

Q. (By Mr. Rowe): And you were the manager of the various organizations that installed those pumps during that time?

A. Departmental manager ordinarily, yes.

Q. And since you became engaged in installing pumps in the San Joaquin Valley, have you ever been sent anywhere as a consulting hydrologist, and if so where?

A. I was sent to the Middle East in 1949 and this past summer I made a trip around the world through the northern hemisphere and down to Australia on various projects.

Q. What countries?

The Court: Water projects?

(Testimony of Charles H. Sortor.)

The Witness: Primarily ground water projects, sir.

Q. (By Mr. Rowe): And in what countries did you do any work on ground water?

A. During this past summer most of my time was spent in Turkey, India, Thailand and Australia.

Q. What did you do in India? [18,019]

A. I made an analysis of some of the ground water conditions in four of the provinces in the Ganges Valley and set up a proposed method of developing ground water and a schedule for doing the work and an estimate of cost.

Q. How big is the Ganges Valley.

A. It is an area about ten times the size of the Central Valley of California.

Q. And you made a study of this valley in 1952? A. That is right.

Q. A ground water study? A. Yes, sir.

Q. Now what other countries did you make a study of ground water in?

A. Well, of Central Anatolia in Turkey—that is the Asiatic side of Turkey—and in the area, in the delta in Thailand and up toward Cambodia in the northwest portion of Thailand, and pretty much a general survey of the hydrologic conditions and potential of the whole country of Australia.

Q. Did you do any work in Egypt?

A. In 1949 I made a survey of the water conditions and potentials in the upper Nile Valley; yes, sir.

(Testimony of Charles H. Sortor.)

Q. And who was the person for whom the work was done, I mean what country, department or what?

A. On these trips I have been in the employ of the Peerless Pump Division of Food Machinery & Chemical Corporation. [18,020] This summer I was loaned to the Fluor Corporation for a portion of the time.

Q. In what capacity?

A. As a consulting hydrologist. They had no hydrologist who was familiar with that type of formation.

Q. And you worked for them, and was that in India?

A. I worked for the Peerless Pump Division but was loaned to them on a reciprocal basis.

Q. Who did you do the work for in India?

A. Again under the employ of the Peerless Pump Division, consulting for the Fluor Corporation, but the data was gathered and the report furnished to the Ministry of Agriculture of India who were making a study of the possibility of developing ground water in the Ganges Valley.

Q. But I mean now in Egypt, who was the work done for?

A. It was done under the employ of Peerless Pump Division and for the Ministry of Agriculture and at the request of the Ministry of Agriculture and Ministry of Public Works of Egypt.

Q. And was that report made by yourself to the Ministry of Public Works of Egypt?

(Testimony of Charles H. Sortor.)

A. Directly to the Ministry of Public Works; yes, sir.

Q. You handled that hydrology?

A. Yes, sir.

Q. And have you since the time you started to work, [18,021] since graduation, have you studied the hydrology and geology in the San Joaquin Valley? A. Yes, I have.

Q. In the well logs? A. Yes.

Q. The effect of pumping and water levels in the San Joaquin Valley?

A. Since 1927.

Q. Since 1927? A. Yes.

Q. Are you familiar with the strip of the river between Friant and Mendota, the river bottom?

A. Fairly well, I think; yes.

Q. Did you ever live on the River?

A. Yes, I lived for three years between Fresno and Friant. [18,022]

* * * * *

Q. That is the degradation of the river bottom between Herndon and Friant? [18,023]

A. The lowering of the river bed in the main channel has been as great as 10 feet in some spots; in many places three or four, even as much as five or six, for long reaches of the river bottom. [18,024]

* * * * *

The Witness: Those holdings represent river frontage for quite a length of the river and the erosion of course is not uniform over any great length, but at the pump on location No. 25, which

(Testimony of Charles H. Sortor.)

is the pump which I operated for three years personally——

The Court: What was your transformer number?

The Witness: Transformer location number is 1600—that is the P. G. & E. number, 1600—and there a large bar of gravel which forms a riffle in the river, as we used to call it, that is completely gone, completely eroded away. The water was, on January 27, 2.5 to 3 feet below the lowest level that I saw during the years '38, '39 and '40 when I operated that pump. [18,026]

* * * * *

Q. Now any other place that you noticed where the river had degraded since you were there?

A. At transformer location No. 13920 on the Folsom property below that of the Rank [18,027] property.

* * * * *

At that point on January 27th I noticed that the bank of the river, that is, the southeast bank of the river, was eroding badly.

Q. (By Mr. Rowe): January 27 of '53?

A. 1953. That the channel, out in the main channel of the river, had eroded considerably. [18,028]

* * * * *

Mr. Hill: That is holding 34. The pumps are located on holding 41-A.

The Court: There are two pumps there.

Mr. Hill: Yes, your Honor.

The Court: That is transformer location what?

(Testimony of Charles H. Sortor.)

The Witness: 2199. We will mark that No. 4. (Marking on exhibit.)

On January 27, 1953 I noticed that the sandbar in the middle of the river had been largely carried away—years ago there was a very large bar there—and that a number of old tree stumps and snags had been exposed by the removal of sand. They didn't show up in '38, '39 and '40 at all when I used to go down there occasionally, nor had I noticed them there years before when I had been at that location when we delivered some pump equipment to that spot.

It would indicate there that possibly as much as 10 feet of scouring had taken place, a remarkable removal of sand. [18,030]

* * * * *

The Witness: At transformer location No. 1780, on the Howard property——

The Court: Was there any erosion of the bottom of the river there?

The Witness: I am sorry. I should have said that I noticed a movement of sand toward the pump at that point, the sandbar was moving out due to the flow of water, moving out toward the pump and in danger of completely submerging the suction pipe of the pump.

Q. (By Mr. Rowe): That was on January 27, 1953?

A. January 27, 1953—pardon me—that was on March 23rd that I noticed this moving, March 23, 1953. [18,032]

* * * * *

(Testimony of Charles H. Sortor.)

I have one more notation on the south side of the river, on the property known as the Holland property—it used to be the Brophy property—transformer location 4991. [18,037]

* * * * *

The bank and channel at that location were cut quite a bit, I would say that the channel there was cut three to four feet below the 1938, '39, '40 level.

* * * * *

Q. (By Mr. Rowe): Now, in January when you were out there, how many of these pumps, in your opinion, could operate under good pumping conditions? [18,043]

* * * * *

The Court: All right, the Brown property, which is now identified as property No. 24, between mile 7 and 8, on the south channel of the river.

The Witness: That is transformer location No. 9297.

There is a six-inch, 10 horsepower 870 r.p.m. centrifugal pump there. It was not running, but I started it and it operated. However, it showed considerable signs of cavitation. [18,046]

* * * * *

The Witness: It serves the Rank property also.

The Court: The pump immediately adjacent to the other.

The Witness: The pump immediately adjacent, upstream.

The Court: That is transformer location what?

The Witness: 6447.

(Testimony of Charles H. Sortor.)

Mr. Goldberg: And holding number——

The Court: Well, it is holding 22, on the left bank of the main channel.

The Witness: That pump had lost its prime, and we were unable to get it started. [18,048]

* * * * *

On transformer location No. 2199, on the J. E. Cobb property,——

The Court: Your location No. 4 on A-9-A-1?

The Witness: No. 4. ——on January 27th, I started that pump and it was cavitating very badly, a very severe case of cavitation.

The Court: Due again to what?

The Witness: Partially, at least, to the water being too far away from the pump or the pump too far away from the water. [18,050]

* * * * *

Transformer location No. 957, our No. 5, or which will be marked today No. 5, there is a six-inch, 10 horsepower, 870 r.p.m. centrifugal pump there.

Q. (By Mr. Rowe): Is that the Lawrence Cobb pump?

A. L. D. Cobb, yes, sir. And there is also—no, on that same pump, on March 23, 1953, I started that pump. It was cavitating. The float over the suction end had slipped and washed partially downstream, and there was a whirlpool forming at the end of the suction, indicating the pump probably would lose prime or, at any rate, was close to the

(Testimony of Charles H. Sortor.)

maximum suction head which it could operate against.

The Court: What would it take to cure that?

The Witness: Get the pump closer to the water, or the water closer to the pump.

The Court: More water in the river?

The Witness: Yes, more water in the river would correct it. [18,051]

* * * * *

At transformer location No. 1780, on the Howard property, marked 6 here today, there is a 7½ horsepower Fresno Agricultural Works centrifugal pump, which we started on January 27th. It ran for about a minute and lost its prime, took air at the end of the suction. That is after we removed the float. [18,052]

* * * * *

The Witness: With that flow of the river, by any means of baffling or floats.

On March 23rd, there was approximately a foot of water over the end of the suction pipe. The pump was still not primed. It might operate with a float, but probably would not operate continuously without some kind of a float over the end of the suction pipe. [18,054]

* * * * *

On March 23, 1953, the water was up to the bottom of the top flange on the bowl unit. The pump probably would operate, but it would be subject to severe cavitation, with that small amount of submergence. [18,055]

* * * * *

(Testimony of Charles H. Sortor.)

Q. (By Mr. Rowe): Now, you have farmed in the area between the bluffs below Friant Dam and Herndon. What has happened since the installation of Friant Dam and the operation of Friant Dam to the land in that area, farming land in that area, between Herndon and Friant Dam, by the operation of Friant Dam?

* * * * *

The Witness: May I preface my statement by an explanation? [18,061]

The Court: Yes.

The Witness: That whole river bottom is underlain with various strata and channels of sand and gravel; and with a high water table,—that is, with what was formerly a normal water table—the underlying gravel was completely filled with water every year, usually for several weeks at a time and even longer. That exposed this soil to the water in the gravel and sand underneath, and did a very good job of subirrigating; so that when I planted cotton on the Folsom property, it was unnecessary to irrigate it on the lower levels before the first of July, and I raised, one year, 2½ bales of cotton to the acre, with three irrigations.

The lowering of the water channel has removed from this underground sand and gravel the water which normally would stand in it for a considerable length of time; so that the soil is no longer saturated down to the sand and gravel.

The effect is it is now necessary to irrigate there about the same as it is anywhere else. In other

(Testimony of Charles H. Sortor.)

words, you would put from 5 to 10 irrigations per year on cotton, on the same ground on which we used to raise a good crop of cotton with three irrigations. So it has radically changed the whole style of farming, and I would say the nature of the farm area. [18,062]

* * * * *

A. It has converted it from one of good subsoil moisture condition, where you had no great tendency to leaching, to one which, due to rather shallow nature of the soil in some places, you are subjected to leaching unless you put exactly the right amount of moisture on the soil so it will be used up entirely by the crops. [18,063]

* * * * *

Q. (By Mr. Rowe): Is the damage to the land, by the operation of Friant Dam, between the bluffs below Friant, is it of a serious or minor nature?

A. It is probably very serious to the people who own the land. I would think it is very serious to the people who own the land.

Q. Now, have you studied the plans of Mr. Lee for collapsible dams?

A. I have seen them, yes.

Q. Would they benefit — in your opinion, are such dams feasible, and would they benefit the river bottom?

* * * * *

A. In my opinion, a series of dams which would allow for the maintaining of water levels at such depths or heights [18,066] as would supply those

(Testimony of Charles H. Sortor.)

underground strata would be beneficial, provided scouring provision is made, and Mr. Lee has included a scouring provision in his design.

I think that perhaps Mr. Lee could improve his design if he would add another structure or two between his No. 2 and No. 3 dams. I think 15 feet is too much of a head differential in that particular stretch of the river to do a good job, in other words, to go back and duplicate the conditions which were there prior to the construction and operation of Friant Dam. [18,067]

* * * * *

The Court: In other words, the greater the wetted perimeter, the greater the percolation, is that right?

The Witness: That is right. [18,083]

* * * * *

The Court: Where does the influence of the San Joaquin River begin on the south side of the river, or did it?

The Witness: The area of influence is still there. It is a matter of is the water there to feed those areas. And in my opinion there are aquifers which are cut across by the San Joaquin River as far up as the gravel pit where that little creek comes in from the south.

Mr. Rowe: Little Dry Creek?

The Court: Get that other map there.

The Witness: From the south.

Q. (By Mr. Rowe): You mean where this little creek comes in, Little Dry Creek?

(Testimony of Charles H. Sortor.)

A. It is near the Ball property, on the Ball property. [18,086]

Q. You mean Pacific Aggregates?

A. That is the location; yes.

Now those aquifers, in my opinion, feed some of the areas between Clovis and the river and extend southwest from there. They are relatively narrow aquifers, most of them not too deep, maybe three feet, four feet of sand, but the one I have in mind supplied a very fine flow of about 200 gallons per minute per foot of drawdown out of a single stratum of sand.

The Court: Where was that well located?

The Witness: That well was north of Clovis.

The Court: Can you locate it on the map?

The Witness: Yes, I think I can. [18,087]

* * * * *

The Witness: It would be in Section 17, Township 11 South, Range 21 East, I believe. [18,089]

* * * * *

The Court: The area between the San Joaquin River and the Kings River is influenced by the San Joaquin, by the Kings and by the ephemeral streams such as Dry Creek, Dog Creek, Fancher?

The Witness: That is a general statement which is true. [18,090] There are areas which no doubt get all their water from one source or the other. In other words, it is reasonable to believe, according to what we know of the hydrology of the area, that there are some small areas within that general area which might get ground water from one or

(Testimony of Charles H. Sortor.)

another. But in general the whole area is influenced by both streams.

* * * * *

The Court: My question, Mr. Sortor, is this: That exhibit, Defendants' S, has marked in red, the heavy red line, the limit of the influence of the San Joaquin River as placed by Mr. Lee.

It has marked in blue the limit of the influence of the San Joaquin River as designated by Professor Smith. And when I say "limit of the influence" I mean the extent of percolating waters underground.

Now my question is whether or not you have an opinion as to whether or not the San Joaquin River contributes to all of the area, or did contribute prior to the building of [18,091] Friant Dam, to all of the area within the red line.

The Witness: I believe that if I may start a little before the beginning in my answer here, I believe that the San Joaquin River originally flowed, at one time, not originally necessarily, but at one time flowed practically due south over what is now Fresno.

* * * * *

Therefore it is my opinion that this alluvial cone here around the San Joaquin River is considerably broader than many hydrologists claim, that in depth we would find that the deeper strata under the city of Fresno and under perhaps the area as far south as Fowler and Selma, the deeper strata were laid down there by the San Joaquin River as it

(Testimony of Charles H. Sortor.)

built its fan around that area, and at that time perhaps if the Kings River flowed it flowed south.

That is not based on geology, it is based on my observations of well borings and similar types of material found at various elevations. [18,092]

* * * * *

Therefore on that basis I would say that the area of influence under condition of heavy pumping would extend considerably beyond the lines of either Mr. Smith or Mr. Lee.

* * * * *

The Witness: The lower aquifers of the area under the city of Fresno and even south to Fowler or Selma were, I believe, eventually made and filled, originally made and filled.

The Court: Filled with water?

The Witness: Filled with water by the San Joaquin River. [18,093]

* * * * *

Q. (By Mr. Rowe): Mr. Sortor, in your opinion—coming to the point—does the city of Fresno today obtain any of its water from the San Joaquin River?

A. I believe that the aquifers at sufficiently low levels are charged from the San Joaquin River.

* * * * *

Q. (By Mr. Rowe): Mr. Sortor, in your opinion, just so I understand you, there are confined aquifers between the river and the city of Fresno, the San Joaquin River?

A. I believe there are, yes. [18,104]

* * * * *

(Testimony of Charles H. Sortor.)

The Witness: My thought is not that they were two separate cones, but that the lower strata extends further out in the same cone, which is typical in the building of a cone.

* * * * *

The Court: And that has confining strata in it connected with the San Joaquin River?

The Witness: Yes, I believe it does. [18,111]

* * * * *

Q. And that area of confinement from the impervious bed above to the impervious bed below extends from Clovis out to Kerman and through the city of Fresno? [18,112]

* * * * *

The Witness: I believe, in my opinion, those aquifers extend at least that far. [18,113]

* * * * *

The Court: Now, assume that water introduced from irrigation on the surface of the ground flows into the San Joaquin River at that point where they intersect with the San Joaquin River, would the San Joaquin River still contribute to those deeper aquifers?

The Witness: Certainly it would. Those were two entirely separate systems, those aquifers.

The Court: Is that true all along the San Joaquin River?

The Witness: Until you get out to the low area, out toward beyond Kerman, out toward the Herminghaus property, yes.

After you get into the very fine material, there

(Testimony of Charles H. Sortor.)

is no aquifer above the river level in some of that area; but wherever there are shallow aquifers which have a perched water supply or superficial water supply, it is possible, and has happened, that water would be running into the river from these shallow aquifers and, at the same time, deeper aquifers were fed from the river itself. [18,117]

* * * * *

A. Then it would be obvious to me we have a perched condition in here, which would not in any way affect the lower strata, as far as flow is concerned.

Q. Would it prevent, in your opinion, the water flowing [18,119] from the lower aquifer across and underneath that mound of water, to the area southerly from it?

A. Exactly. It would not. This is the sort of thing which causes water to flow into the river, the shallow level in the bluff, seeping out where aquifers are cut by the river and still permit water to flow from the river in the deeper aquifers away from it.

Q. Again referring to the area due north of the city of Fresno, that ground water mound, as I understand your answer it would not prevent the San Joaquin flowing through the aquifers to the wells of the city of Fresno?

A. This is a superficial condition, and would not necessarily affect the lower strata.

Q. And you indicate the superficial condition as

(Testimony of Charles H. Sortor.)

the area in the township just north of the dot marking the city of Fresno?

A. Where you show the high water table.

Q. What, in your opinion, causes that ground water mound?

A. Well, it is water in the shallower aquifer, fed by septic tanks, by cooling water, return wells, excess irrigation, by wells cutting through generally formations that are connected to aquifers; and it is a type of water supply which would be very quickly drawn away, if you pumped on it. It is not the type of formation or aquifer that would supply heavy pumping. [18,120]

* * * * *

A. You can't look at a ground water map and tell what is under it. It is a clue as to what might be going on.

You refer to Cal. W as the marking on the exhibit. You couldn't look at the exhibit and tell what the different formations [18,121] would deliver, or the true ground water condition, either.

The Court: Or the source of the water?

The Witness: Or the source of the water. Just looking at that map alone, you couldn't do it.

Q. (By Mr. Rowe): When you were down in India, though, did you ever run across one of those swami gentlemen who could determine it from a map like this? [18,122]

* * * * *

(Testimony of Charles H. Sorter.)

Cross Examination * * * * *

Q. (By Mr. Abercrombie): I stated it for the record, as starting up where Little Dry Creek joins the San Joaquin, coming down then to the city of Fresno, back to the river—to Figarden and back [18,133] up to the river, to the point of commencement, a rough triangle.

The Court: It is a triangle, the base of which would be the Southern Pacific Railroad?

Mr. Abercrombie: Yes.

Q. Would you expect, in that area, in the shallow overlay, which you referred to, extending perhaps 100 feet deep, to find extensive confining beds?

A. Yes, you would find confining beds. "Extensive" is a relative term. [18,134]

* * * * *

The Witness: From the information I have, I am led to believe there are continuous aquifers leading from the apex of the triangle you have outlined, down to the city of Fresno. [18,135]

* * * * *

Q. (By Mr. Abercrombie): Now is it your opinion that the low flows that have been released from Friant Dam are the major causes of degradation?

A. The regulation of the stream which prevents bringing in of any more material to replace that which is washed out has been the cause I think of the degradation.

In other words, you have a stream flowing through a formation that can be cut by the water

(Testimony of Charles H. Sortor.)

and it will remove material from it. If you are constantly replacing material from a higher source than you won't have much change in your level of the river, of the stream bed, but if you remove the source of material which is continuously brought down by most [18,157] streams, if you remove that source then you have no source for rebuilding the river bottom with the result that your channel will cut deeper and deeper. [18,158]

* * * * *

Redirect Examination

Q. (By Mr. Rowe): Mr. Sortor, directing your attention solely to the matter of the economy, maintenance and ease of pumping from the river, either directly or from sumps or from horizontal wells, and assuming a flow in the river varying from that read to you by the judge yesterday up to flood flows of 8,000 second-feet, such as we had in the river last year, which do you recommend as a matter of sound engineering practice, the installation of horizontal wells, sumps and pump changes and channelization of the river, or a series of dams such as Mr. Lee designed?

A. I would recommend a series of dams.

Q. Now, would any pump modifications, horizontal wells, would that restore this water support under the lands in the river bottom?

A. No, it would not.

Q. And would this leaching and increase in irrigation continue, if you had a flow such as read

(Testimony of Charles H. Sortor.)

to you by the judge yesterday, in the river, as recommended by Mr. Hill? [18,189]

* * * * *

The Witness: It would not prevent it. Those processes would not prevent the leaching, and extra irrigation of the [18,190] lands in the river bottom.

The Court: If I understand you correctly, the only thing that would prevent the leaching of the soil would be to restore the water level in the river bottoms to the point where there would be subirrigation?

The Witness: Yes, that is my point.

Q. (By Mr. Rowe): Mr. Sortor, now in the river bottom, have you ever noticed where subterranean channels take off upstream, say from your ranch that you used to manage, and come down just under the surface, and disappear toward the bluffs?

A. Yes, I have. On the property now owned by Mr. Folsom, just a little way west, I would say, maybe a couple of hundred yards west of the southeast corner of the property, there is an area where there is an outcropping of moisture, or was in the time of 1938, '39 and '40, which was rather easily traceable to an aquifer which had its source of water at a point somewhere between—approximately at the Sunshine Ranch property owned by Mr. Cowan Sample at that time. It ran in a northeasterly direction, cut across the Dawson property, and at a point north of the—there is an intersection of three roads there along the south bank of

(Testimony of Charles H. Sortor.)

the river; at a point north of that it apparently connected with the water source in the river.

Q. And by the time it got to your property, was this [18,191] underground stream at a higher elevation than the water in the river at right angles?

A. It was fully 10 feet above the river level. There would still be moisture in that soil, due to the exposure of the aquifer. [18,192]

* * * * *

EVERETT G. RANK

recalled as a witness by and on behalf of the plaintiffs, having been previously duly sworn, resumed the stand and testified further as follows: [18,289]

* * * * *

Direct Examination * * * * *

Q. (By Mr. Rowe): Now take No. 3, also on the Pierce property, I believe——

The Court: That is on the Rank property, is it not?

The Witness: Yes, it is on our property. It is known [18,301] as the Pierce ranch, but we own it.

Mr. Rowe: No. 25.

Q. When did you notice that was dry?

A. A man came to work one morning and said he didn't have any water in the well. That is when we noticed it.

Q. When was that?

A. That was in August.

Q. August of 1952? A. Yes.

Q. What did you have to do?

(Testimony of Everett G. Rank.)

A. We got a well driller and put this casing down in there and we went as deep as we could. There is a light shoe on the steel casing and we couldn't go more than 24 feet. That is, we put in another well so we could have water for domestic purposes.

Q. Now take this No. 4——

The Court: Did you put in another well?

The Witness: We went right down with the casing inside of this one.

The Court: Did you get water at 24 feet?

The Witness: Yes, sir, we get plenty of water at this time with a pressure system.

The Court: And since you did that in August that well has produced water?

The Witness: Yes, sir. [18,302]

* * * * *

Cross Examination * * * * *

A. I don't think any of them did, Mr. McPherson.

Q. (By Mr. McPherson): When did the first one go dry that you have mentioned here this morning?

A. Well, on our own wells there on the Pierce place, I believe it was two years ago my son went down and dug it deeper, the one we use as a domestic well now.

Q. Is that the one with the recorder on it?

A. No, the other one.

Q. How much did he deepen that? [18,330]

A. I think about 18 inches. [18,331]

* * * * *

CARL HOBE

called as a witness by and on behalf of the plaintiffs herein, having been first duly sworn, was examined and testified as follows: [19,118]

* * * * *

Direct Examination

Q. (By Mr. Rowe): Mr. Hobe, have you measured wells——

The Court: What is your occupation?

The Witness: Petroleum engineer and rancher.

The Court: And a rancher?

The Witness: Yes. [19,119]

* * * * *

CHARLES H. SORTOR

recalled as a witness by and on behalf of the plaintiffs, having been previously duly sworn, was examined and testified as follows:

* * * * *

Direct Examination—(Continued)

Q. (By Mr. Rowe): Your company has put in about what percentage of the pumps in the San Joaquin Valley?

Mr. Goldberg: You mean the Peerless Pump Company?

Mr. Rowe: Yes.

The Witness: About half, I believe, Mr. Rowe.

* * * * * [19,864]

(Testimony of Charles H. Sorror.)

Cross Examination * * * * *

The Court: What is the source of the lower aquifers, of water in the lower aquifers?

The Witness: I believe that a good deal of it is San Joaquin River water. [20,169]

* * * * *

The Court: I understood you to say that in your opinion there was an aquifer leading from the San Joaquin River and connected with it, and deep, that is below the surface of the river, which connected with and flowed under the city of Fresno.

The Witness: I think there are a number of aquifers. [20,173]

* * * * *

A. Water from the river probably has gone over the entire surface of the aquifer—pardon me, I didn't mean "aquifer"; I mean alluvial plain.

* * * * * [20,204]

Q. (By Mr. Goldberg): Well, first of all, what do you mean by "perched water"?

A. Water which is at an elevation somewhat higher than we would expect from the normal aquifers underlying it.

Q. Separated from those aquifers by what?

A. More or less impervious formations. [20,207]

* * * * *

Q. Now, is the water in that water table contributed to by the San Joaquin River? [20,208]

The Court: In the perched water table?

Mr. Goldberg: In the perched water table.

(Testimony of Charles H. Sortor.)

The Witness: I do not believe it is. [20,209]

* * * * *

Q. Do you know the depth of the aquifers from which those wells take their water?

A. In most cases—in fact, all the cases I am familiar with, since Claude Weeks has had charge of well drilling in the city of Fresno, they have always drilled single cavity wells. Therefore the aquifer would be immediately below the casing.

Mr. Child: What depths?

The Witness: 2 to 400 feet. [20,316]

* * * * *

Q. Now in your opinion are those aquifers at the level of 400 feet supplied with water from the San Joaquin River?

A. I believe that some of them are, yes. [20,317]

* * * * *

The Court: Do you rely on those ground water maps in your business?

The Witness: Not theirs, no. We rely on actual tests of wells made throughout the season and averaged by ourselves and by the Pacific Gas & Electric Corporation, who make a very careful study of it. [20,341-42]

* * * * *

The Court: Your position, then, is that you cannot determine the surface of the ground water by measuring wells of greatly varying depth over a wide area?

The Witness: Right. [20,349]

* * * * *

(Testimony of Charles H. Sortor.)

A. You could develop a ground water contour map, if you took water pressures. You could not develop a ground water contour map if you took distances to water surface, unless you measure the geology.

The hydrology would play a very small part in the ground water contour, if you simply measure the distance down to the water where you find it, as you first encounter it. [20,389]

* * * * *

The Witness: It is my opinion that the degrading of the river has been caused by the changing of natural flow.

In other words, the river in its natural state was not degrading. Now in its controlled state the river bed is degrading and that leads me to believe, and it is my opinion, that this has been caused primarily by change in the natural flow of the river.

* * * * * [20,413]

A. That is right, it is not completely confined. Furthermore, it is under a gradient head which will permit acceptance of water from the stratum above. That will mean, Mr. McPherson, that you have at that point a very low head on that aquifer.

Now, where that water shows up is downstream from the point of percolation. And you get most of your recharging of aquifers in the areas closer to the mountains, where you have coarse sands. In other words, your best recharge areas are generally the areas fairly close to the mountains and fairly near the center of the alluvial fans. [20,584]

* * * * *

(Testimony of Charles H. Sortor.)

The Court: So if there were a free water table in this area then there would have been—you could not have gone [20,612] through an alkali and get to clear sweet water?

The Witness: Unless you had some absolute impervious——

The Court: If it was a free water?

The Witness: If it was perfectly free water, no.

The Court: In other words, by a confined aquifer and the other area you mean there is not the same amount or degree of circulation, there is circulation but not the same amount or degree of circulation between the confined aquifer and the unconfined area?

The Witness: That is right. [20,613]

* * * * *

The Witness: But that is a different comparison, your Honor. A free water table would exist in a large body of sand, as I understand it, where you have actual freedom of movement, the water can move, and there you would establish a cone of depression as described in this paper.

But we don't have large bodies and reaches of sand here; we have relatively narrow channels.

* * * * * [20,618]

Q. (By Mr. McPherson): But you are listed in the city directory as a sales manager of this company as I read it to you?

A. That is right. That is what I get paid for.

Q. And have always been so listed since you have been connected with the Peerless Pump?

(Testimony of Charles H. Sortor.)

A. No, I was district engineer, superintendent for the company, for two or three years.

Q. That was before you picked up this listing as we now read it? A. That is right. [20,622]

* * * * *

Redirect Examination * * * * *

A. I actually went to Egypt only once. I made two trips to the Upper Nile Valley.

Q. (By Mr. Rowe): Well, the second trip up the valley.

A. The second trip, with Norris Dodd, who is the Director-General of F.A.O.

Q. And what is F. A. O.? What is its name, and what is it?

A. Food and Agricultural Organization.

It is an organization within the United Nations, operated by the United Nations. Its function is to study food production, including improvement in seeds, growing techniques, irrigation, mechanization, and any development which will improve the food production throughout the world.

It operates in nearly all of the countries outside of the iron curtain. It is primarily an advisory organization. It does not actually undertake projects. It has no budget for doing the jobs. [20,633]

Q. It helps in an advisory capacity?

A. Yes, and recommends to the World Bank and other financial organizations whatever projects it believes should be endorsed.

(Testimony of Charles H. Sortor.)

Q. What was the name of the director of the FAO?

A. Norris Dodd. He is an American from Oregon.

Q. And what kind of work did you do in the Upper Nile Valley with Mr. Dodd?

A. The Egyptian government and the secretary of the FAO from the Middle East asked me to go along to discuss my findings with Mr. Dodd and to compare notes with him. Mr. Dodd, incidentally, is quite a large farm operator also and a practical man.

Q. And did you go into the matter of well cores, hydrology and groundwater with Mr. Dodd?

A. Yes, I did.

Q. Now while you were up in the valley you mentioned dust and the effect of dust. What is the effect on an abandoned stream channel, what will dust do over a long period of time?

A. Well, if there is a deposit of dust it will seal it off. In other words, it would form or could form a roof to an aquifer.

Q. Over an abandoned stream channel?

A. Right. [20,634]

Q. While you were in Egypt, did you have occasion to notice the amount of dust that accumulates over a period of time?

A. Yes, I did at the Temple of Luxor because they had excavated there down to the old entrance level, something over 20 feet, and it was told me

(Testimony of Charles H. Sortor.)

there by people who appeared to know the history that that was a deposit of some 5000 years.

Q. And how deep was it?

A. Something over 20, between 20 and 25 feet in depth.

Q. From 20 to 25 feet in depth? A. Yes.

Q. And was deposited in 25 years?

A. 5000 years.

Q. And you attribute that to dust?

A. It was obviously a windblown formation. There had been no water over it, no way for any deposition to be made except wind-borne. [20,635]

Q. (By Mr. Rowe): Now you have lived here in the valley for how many years?

A. About 44 years, I believe, Mr. Rowe. [20,636]

* * * * *

Q. (By Mr. Rowe): Now going further along Mr. McPherson's line about your experience in hydrology, have you ever been offered any other jobs since you returned from Egypt?

A. Yes.

Q. As a hydrologist? A. Yes, I have.

Q. Who by?

A. Well, in 1951 I had a request to return to Egypt and undertake a project there, and last summer Hefnawy Pasha — he is not any longer Pasha since Mr. Naguib stripped him of his title— but I met Hefnawy in Ankara, Turkey, and he urged me to leave my present employment and move to Rome and take over their irrigation engineering and hydrological research.

(Testimony of Charles H. Sortor.)

Q. For whom? A. For the FAO.

Q. What would have been the extent of the territory?

A. Well, it would extend from West Pakistan to Libya and from Uganda, including Uganda, to the northern boundary of Italy and Greece, including all of the Arabic countries, in other words.

The Court: And Italy and Greece?

The Witness: And Italy and Greece. [20,638]

* * * * *

Q. Is 5 second-feet in the river bottom, as it actually exists, would that supply the aquifers presently feeding from the waters of the San Joaquin River?

A. I am sure it would not. [20,651]

* * * * *

Q. (By Mr. Rowe): If you ran 5 second-feet down the San Joaquin River for the next five years, together with 5 second-feet at Gravelly Ford, what would happen to wells pumping from aquifers supplied by the San Joaquin River north and south of the river between Friant and Gravelly Ford, in your opinion?

A. That is a total flow of 5 second-feet?

Q. 5 second-feet past all places.

A. I think they would be very badly damaged. I think their flow would be greatly reduced. The pumping level would increase and, unless some other water were available to those aquifers, they might even dry up. [20,652]

* * * * *

(Testimony of Charles H. Sortor.)

Q. Now, in your opinion, can correct lines of equal ground water elevation, which would show the direction of the flow of the water underground, be made from the data in Cal. D and Cal. QQ-2, south of the San Joaquin River in Township 12 South, Range 20 East, and 13 South, Range 20 East?

A. Not from the data there, no. [20,653]

* * * * *

The Witness: That is a domestic well. No depth given as I understand it, and I think probably not too deep.

Q. (By Mr. Rowe): How deep is it?

The Court: That is in Section 4, Township 13 South, 20 East, and is 1115 feet west and 180 feet north of center, which would make it about two miles or more from the other well.

The Witness: Right.

Q. (By Mr. Rowe): What are the depths of the domestic wells?

A. About a hundred feet, 100 to 110 feet in that area is the common depth.

Q. All right. [20,661]

The Court: But you do not know the depth of this one?

The Witness: I do not know the depth of this one.

Mr. Goldberg: Your Honor, for the record, you are referring to QQ-2, Cal. QQ-2?

The Court: The data in Cal. QQ-2 and I have been reading from that data here.

The Witness: 5B is also a domestic well.

(Testimony of Charles H. Sortor.)

The Court: And that is located in Section 5, 13 South, Range 20 East, 1/8 of a mile east and 115 feet north of the west quarter corner. That would be——

The Witness: That is located on the map.

The Court: That would be about a mile——

The Witness: Half a mile south, and a mile and a half west of Pinedale.

The Court: It is about a mile from the other well, 4A?

The Witness: Right. Another domestic well.

The Court: And no depth?

The Witness: No depth.

Now in Section 7, Well 7B——

The Court: Just a moment. Let me see. There is a 7A here. It is the same well. It is Well No.——

The Witness: It is 86 feet, that is, 7A. It is my error.

The Court: Just a moment. The record shows that it has two numbers. The State's number is 13, 20, 7A and the local [20,662] number is 13, 20, 7B, USBR. I take it it is their number. And that is located in Section 7 of the same township and range, 300 feet east of the northwest corner, which is about two miles from Well 5B, is it?

The Witness: It is a little less than two miles, your Honor. It is on an angle but it looks like maybe a mile and a quarter.

That is a domestic well, 86 feet deep.

Now none of these domestic wells are subject to heavy pumping and very few of them are deep enough to penetrate formations that are pumped

(Testimony of Charles H. Sortor.)

heavily, therefore you don't have any means of knowing that you have a true water pressure when you take the standing level in those wells. [20,663]

* * * * *

The Witness: 2-A is a dug well, and has been abandoned, I don't know why; but it obviously wouldn't have penetrated very many aquifers. It would be definitely influenced by seepage water. In other words, it just isn't possible to do too much digging below the level of your first aquifer in that type of a well.

The Court: It is in the river bottom?

The Witness: It is in the river bottom, yes.

2-B and -C, or B and E—they are listed both ways, 2-B in one place and I think 2-E in another, and the U. S. Bureau of Reclamation number is 2-B—is a well on the old Pearce property, which is down in the river bottom. No depth given there.

The Court: It says "Everett Rank."

The Witness: Yes, Mr. Rank now owns that property. I said "the old Pearce property." I always think of it as the old Pearce property.

2-B indicates it is a 15-foot length of one-inch pipe driven into the ground. That might or might not mean something, depending on how it was done. If you were sure you could get a drive point on the bottom, and were sure you got into an aquifer, you might have something. Otherwise you [20,673] might just have a little perched water table from over-irrigation, or a septic tank, or anything of that sort.

(Testimony of Charles H. Sortor.)

The Court: Is this in the river bottom?

The Witness: Yes.

The Court: 9-13-51 dry, and 10-25-51 dry.

The Witness: So you see that is not very good data on which to draw a ground water contour, when you are measuring a dry well. [20,674]

* * * * *

The Witness: These others are across the river on the other side. They didn't pertain to the question as it was asked.

Q. (By Mr. Rowe): Now, Mr. Sortor, is it possible, using domestic wells and wells less than a hundred feet deep in the area south of the river, in Township 12 South and Township 13 South, Range 20 East, to correctly draw lines of equal ground water elevation?

A. No, I don't believe it is. I don't mean by that to criticize the job of engineering that was done. The people who did it had to use the data that was available. But I think it is deplorable that a matter of such gravity as this would be decided on the basis of information as poorly gathered. [20,675]

* * * * *

Q. (By Mr. Rowe): Well, Mr. Sortor, now taking the fact that the State in drawing its lines of equal ground water elevation on Cal. W and Plaintiffs' 167 used 13 wells in the city of [20,676] Fresno varying from 195 to 525 feet deep, and taking the balance of the wells between the city of Fresno wells in Township 12 South, Range 20 East, and Township 13 South, Range 20 East, would it

(Testimony of Charles H. Sortor.)

be possible from the water well measurements in Cal. QQ-2 and Cal. D to draw a map of equal elevation of ground water in wells in the area in Fresno County located in Township 12 South, Range 20 East, and Township 13 South, Range 20 East, from which you could determine in which direction the water was flowing between the river and the Fresno city wells?

A. I don't think you could do it, Mr. Rowe, and be sure of your information.

* * * * *

Q. Well, in your opinion, is there sufficient data in Cal. QQ-2 and Cal. D from which you can determine the direction of the flow of the water underground in Township 12 South, Range 20 East, and Township 13 South, Range 20 East, south of the river?

A. I don't think that there is sufficient data of known accuracy. [20,677]

* * * * *

(The pictures referred to were marked Plaintiffs' Exhibit No. 247 for identification.)

Mr. Goldberg: How do you describe those pictures, Mr. Sortor, as stereoscopic views?

The Witness: This is a stereoscopic viewer. They are pictures taken by a camera arranged to photograph underground formations, and particularly underground wells or underwater formations in under-water wells, which was designed and perfected by our own organization and Mr. Claude Laval here in Fresno. [20,686]

* * * * *

(Testimony of Charles H. Sortor.)

We have taken some pictures of encased wells, just to see what they looked like, but we haven't——

Q. In the Fresno area?

A. Yes. There isn't enough value to a well here to warrant doing a lot of repair work on it. When a well goes bad here, you abandon it.

* * * * *

Q. Part of the study and investigation you made in this case is based on photographs of actual conditions underground?

A. That is a matter of experience, and it certainly has a tendency to form an opinion for you, yes. [20,692]

* * * * *

Q. (By Mr. Rowe): Mr. Sortor, on your qualifications also did you ever teach any classes in any college or university or lecture for them?

A. I have occasionally lectured to classes as a guest lecturer.

The Court: Where?

Q. (By Mr. Rowe): What colleges?

A. At Fresno State and Stanford.

The Court: On what subject? [20,695]

The Witness: Ground water, fluid mechanics, irrigation practice and irrigation engineering.

Q. (By Mr. Rowe): Now Mr. Goldberg asked you—I don't recall exactly what he said—something about test wells for pumping a well in some sort of a test well.

Assuming a well anywhere from 190 to 250 feet deep pumping—that is, unperforated—and assume

(Testimony of Charles H. Sortor.)

that that has a hundred foot horsepower pump——

The Court: A hundred foot horsepower pump?

Mr. Rowe: Yes, motor on the pump.

The Court: You mean a hundred horsepower pump?

Mr. Rowe: A hundred horsepower pump. Pardon me.

Q. ——and the water is from 40 to 50 feet deep, that is, from the surface in this well, and the drawdown would be 10 to 15 feet when it pumped, and there was one of Mr. Goldberg's test wells or domestic well, say 50, 75 feet away, and it you pumped——

The Court: How deep?

Mr. Rowe: 50 to 75 feet away.

The Court: How deep?

Mr. Rowe: Oh, 60 feet deep.

Q. ——and the test well and the other well go through alternate layers of clay and sand, and you pump the hundred horsepower pump for a couple of hours and you showed a drawdown [20,696] of a foot and three-quarters in the domestic well, or test well, whatever Mr. Goldberg referred to, what would that indicate to you?

A. Now this hundred horsepower pump, Mr. Rowe, how much water would it pump?

Q. 1500 to 2250 gallons per minute.

A. Well, it would indicate that either one or both of the aquifers—these are open bottom wells?

Q. Yes.

A. So that only one aquifer in each well would

(Testimony of Charles H. Sortor.)

be affected, but either one or both of the aquifers would be pretty well confined.

Q. Supposing it didn't pull down, this domestic well, pumping for two hours with a drawdown of 10 to 15 feet and with 1500 to 2250 gallons per minute, if it didn't pull down the 60 foot water in the 60 foot domestic well at all and it was 75 feet away from it, what would that indicate?

A. Well, it would indicate confinement of the aquifers, one or both of them confined. [20,697]

* * * * *

Q. Now pointing out Defendants' H and your lines of influence, or where the San Joaquin flowed, in your opinion does the San Joaquin River supply any part of the waters underground, percolating waters in Tranquillity Irrigation District, James Irrigation District or, say, in the Traction Ranch?

A. Yes, I believe that San Joaquin water does contribute [20,698] to the underground waters there quite a bit.

Q. And as I understand you — just trying to close my testimony here—the San Joaquin supplies percolating waters today underground to the wells in the City of Fresno?

A. Yes, I believe it does.

Q. And that would be, in your opinion, all of the wells?

A. Yes, I think all of the deeper wells at least are supplied partly and probably to a considerable extent from the San Joaquin River source.

* * * * *

(Testimony of Charles H. Sortor.)

Q. My final question—I believe you have already answered it—that in your opinion Mr. Lee's plan would be very satisfactory, not only to aid the lands in the river bottom but to supply the percolating waters beyond the bluffs between Friant and Mendota?

A. Well, I believe it would be reasonably satisfactory, yes. I think that it is going to be very difficult to ever duplicate the conditions that existed before confinement of [20,699] the river, but I think it is probably as good a system as could be devised to do that.

* * * * *

Q. And you feel that flushing the river, flushing the dams out, is necessary or isn't?

A. I think it is absolutely essential. Otherwise you are just going to have a bunch of little waterfalls. Wherever you have a dam it would fill up with sediment behind it. [20,700]

* * * * *

The Court: Well, if you kept the ground water level up in the river bottoms sufficient to keep the willows growing, and so forth, that you have described before, if that were kept up would that, in your opinion, be a sufficient water height in the river to feed the aquifers that are beyond the bluffs?

The Witness: Yes, I think it would feed them where they contact them. [20,714]

* * * * *

Q. (By Mr. Goldberg): Directing your atten-

(Testimony of Charles H. Sortor.)

tion to Cal. A-26-A-1, Mr. Sortor, * * * * * [20,735]

Q. And if the water goes down the pressure gradient in the aquifer the water moves along the line of the aquifer? A. True.

Q. Which may or may not be the line of the contours? A. That is right.

Q. Because you would have a different pressure gradient for each aquifer? A. Right.

* * * * *

These sampling wells would not be pumped wells at all, they would be wells removed from pumping wells.

The Court: In other words, they would just be holes in the ground?

The Witness: Holes in the ground, 6-inch wells, blown out with an air pressure——

Mr. Goldberg: Blown out, what? [20,737]

The Witness: Blown out wells with an air compressor so they would be clear of any sediment or any localized impervious material that might be caused by drilling.

In other words, it would be wells which would be capable of being pumped but were not being pumped. 20,738]

* * * * *

The Witness: However, if you have reasonably uniform depths of aquifers you are probably going to have reasonably uniform results, assuming that you are deep enough down in the ground to have reached a stage of equilibrium as far as pressure goes.

(Testimony of Charles H. Sortor.)

You may have a well pumping out of an aquifer but you are measuring it low enough down so that there still exists a normal quantity of water or a considerable quantity of water above that aquifer. In other words, you are not just going into the first wet streak of sand that you find.

My quarrel with this method here, Mr. Goldberg, is this: First of all the data is taken as best the men could possibly do who collected it, but they were hampered by not having even all the statistics on the points they were reading.

Secondly, they are annual maps, as I understand it, taken at a single period. [20,740]

Mr. Goldberg: That is correct.

The Witness: Now for a condition in equilibrium, or an area in equilibrium, with no flow, no inflow and no output, that would mean something, but this doesn't show you a thing. It is like a jigsaw puzzle. You will have 365 pieces and you are looking at one piece. You don't know whether you have got an elephant or a horse. If you had all the pieces and put them together you would get a good picture.

That is what you would have if you had a recording system on wells intelligently placed to bring out the information you wanted and it would be possible with such a system to determine the pressure gradients which would determine the direction of flow, which could lead to a determination of the source of the water. [20,741]

* * * * *

(Testimony of Charles H. Sortor.)

The only point I am making is that you can't get a reasonable interpretation if you have faulty data, and that is what we have in these maps.

Q. You are aware of the fact that these measurements are all taken in the fall of the year?

A. Which is the poorest month in the year to take them, Mr. Goldberg, the poorest months in the year are in the months when they are taken.

Q. I think they are taken in October, November and December.

Q. And a better time would be June, July and August, or even July, August and September, because then you have a condition of dynamics, while at the present time you have more or less a condition of static.

Now a better arrangement would be to take them both times of the year, at the time of minimum withdrawal and at [20,742] the time of the maximum withdrawal, and then you would at least have some kind of a picture of what is going on.

* * * * *

The Witness: I have told you how you would do that and one way to do that would be by placing special wells for this purpose, wells that were never themselves pumped after they were first developed.

* * * * *

Now there is one thing there that would not reflect well with the data that you have. You have domestic pumps that are never shut down for very long. Domestic pumps usually run an [20,744] hour or two a day in this country at least and they may

(Testimony of Charles H. Sortor.)

start 50 times a day. You have irrigation wells which might stand idle for two weeks at a time, even in irrigation season, so that it would be very hard with the wells that you have to really get something that means anything. [20,745]

* * * * *

Q. Now, one last question, Mr. Sortor. Your particular object of study and interest in ground water is the determination of the size of pumps, and whether the wells in which the pump is seated is going to yield water satisfactorily?

A. Not necessarily, Mr. Goldberg. My particular interest is longer range than that, because my company enjoys the complete confidence of very many pump owners and users, and I am expected to be able to advise them, not only as to yield of an individual pump, but as to the trend of the ground water in the area, the likelihood of the necessity for replacing equipment, the possibility of improving of well design or irrigation [20,749] structures, the possible savings or improvement in efficiency of water application, and a multitude of other problems. [20,750]

* * * * *

Recross Examination * * * * *

Q. (By Mr. McPherson): Now, both of those wells, and the others that you said the same phenomena was observed in going as far as Mendota, would be either in or westerly of the artesian belt,

(Testimony of Charles H. Sortor.)

as shown on Mendenhall's map, A-4-A; is that not correct? [20,751] A. That is right.

Q. And you would not expect the phenomena, whatever it might be, observed in those wells, to occur in the area easterly of the artesian belt described in A-4-A, would you?

A. Yes, I would.

I would like to cite the well at Dakota and Moroa. If you put a perforated casing in that well, you would have circulation of the water from the wet strata to the dry strata.

Mr. Rowe: That is the city well on the Herndon Canal?

The Witness: That is right. That is exactly the same condition.

All it means is you have a confined strata under certain head pressure, adjacent to another confined strata under a different head pressure. [20,752]

* * * * *

A. Well, no. If they are connected—if two aquifers are connected, then you would have no gradient. You would have just like the connection between two Siamese twins, the physical continuation of the body of sand. [20,753]

* * * * *

Now, the difficulty is that we see only the borings from a single well, which is from six to 30 inches in diameter; so all we can see is just this little layer cake.

Q. That is right.

A. When actually the aquifers are stream beds,

(Testimony of Charles H. Sortor.)

and the clay beds may be continuous all around them.

So you may have one continuous layer of clay which surrounds many different aquifers.

Q. That is right. You also——

A. It precludes the possibility of water sneaking out of one of the aquifers and slipping around the clay bed. It just doesn't work. [20,754]

* * * * *

The Witness: It is possible, yes. It is possible you might have the existence of a mile of confinement, or two miles wide clay beds, but I believe those clay beds and the more or less permeable material constitute a large percentage of the underground formation, and the aquifers are threaded through them like tubes.

If you can imagine making up these reinforced steel tubings, and with the concrete around them, and you make those reinforcing bars hollow so the water can pass through, and you would have a system of concrete composing the single non-pervious formation. [20,755]

* * * * *

A. Partially. It is due also to a lesser inflow into the area, partly due to the restriction of Friant, partly due to the reduced acreage.

The Court: In your opinion, does the regulation of the river and the interruption of its natural regimen of flows which has occurred since the building of Friant Dam, has that caused the water level in the wells to go down in this area?

(Testimony of Charles H. Sortor.)

The Witness: I believe it has, your Honor. You will notice the level stays pretty steady until 1942 and then it started down. [20,769]

* * * * *

GEORGE M. STANLEY

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Give me your full name, please.

The Witness: George M. Stanley.

* * * * *

Direct Examination

Q. (By Mr. Rowe): Professor, would you state your education, beginning with college?

The Court: For the record, where do you live? Where do you reside?

Q. (By Mr. Rowe): You live in Fresno, do you not?

A. I have lived in Fresno for almost five years.

I went to college at the University of Michigan, Engineering College, and I continued in college at the graduate [20,780] school there, studying geology.

Q. And what degree did you get at Michigan?

A. I got a B.S. in civil engineering, in 1927, and a Master of Arts in 1932, and a Ph.D.—a Master of Arts in 1930, and a Ph.D. in 1932, both in geology.

Q. And when you were in the engineering school,

(Testimony of George M. Stanley.)

was it strictly engineering, or were you majoring in engineering?

A. It was strictly engineering and hydrology.

Q. And the Master of Arts and Ph.D. were in geology?

A. Yes.

Q. Did you ever teach at the University of Michigan?

A. Yes, I started teaching part time there in 1930, while I was still working on my doctor's degree, and up until 1948, when I resigned to come to Fresno.

Q. And what position — did you ever hold the position, say, Associate Professor of Geology?

A. That is right.

Q. For how many years?

A. From 1938 to 1948.

Q. Ten years; and why did you leave Michigan?

A. Well, I have a little girl that couldn't stand the winter climate there.

Q. You came here for her health?

A. So I came to a milder climate.

Q. What is your position at Fresno State College? [20,781]

A. Associate Professor.

Q. Of geology?

A. Yes.

Q. And you have been that since 1948?

A. Yes.

* * * * *

Last summer, 1952, I taught on the campus at Stanford, a course in beginning geology. That was the only course taught on the campus in geology in the summer school.

(Testimony of George M. Stanley.)

Q. So in 1952, you were the only instructor at the summer school, in geology, at the campus or on the campus?

A. Teaching on the campus, yes. [20,782]

* * * * *

Q. Now, have you examined the so-called blue lines on Plaintiffs' Exhibit 30——

A. Yes. [20,783]

* * * * *

Q. (By Mr. Rowe): Now, have you checked those, have you studied those lines, to determine whether they are correct or not, as showing abandoned courses of the San Joaquin River, the ancient channel?

The Court: As evidenced from the surface?

Mr. Rowe: Yes.

The Witness: Yes, I have. I have studied the topographic sheets a good deal for just that purpose, and I have gone out on limited examination of the ground, over part of the area, following some of these lines, and I am sure they represent lines of flow of the San Joaquin River distributaries at a former time, a very ancient time compared to the present channel.

The Court: A prior flow, then it degraded to its present channel?

The Witness: Yes, sir.

Q. (By Mr. Rowe): In your opinion, are these L lines of Mr. Lee—do they correctly depict the abandoned channels of the San Joaquin River?

(Testimony of George M. Stanley.)

The Court: He just got through answering that. He said in his opinion they did.——

The Witness: Correct. [20,784]

* * * * *

Q. (By Mr. Rowe): Now, have you prepared a blueprint of these channels, I mean put them on a separate exhibit, showing these ancient channels of the San Joaquin River?

A. Yes. This little diagram shows the L lines, the L lines on these topographic sheets exactly as they are drawn on here, plus the boundaries of the San Joaquin cone as they are shown on these sheets in red.

Q. Now, in your opinion, does the——

The Court: Let me see one.

Mr. Rowe: Yes. May I have that marked for identification as Plaintiffs' exhibit——

The Clerk: 248 is the next one.

The Court: 248.

* * * * *

Q. Now, would you just explain the meaning of the various lines on Plaintiffs' Exhibit 248?

A. The regularly solid line represents the present San [20,785] Joaquin River, being a slightly heavier line than the others.

The other regularly solid lines show the L lines, as shown on these topographic sheets in blue.

Q. On Exhibit 30? A. Yes.

* * * * *

Then close to the river there is a little hatched line to indicate the valley bluffs, and there is also a

(Testimony of George M. Stanley.)

solid line outlining the City of Fresno and the Tranquillity Irrigation District.

Q. (By Mr. Rowe): Now, in your opinion, does the cone line on Plaintiffs' Exhibit 30 — is it correctly depicting, that is, the topographic cone?

A. It seems to me to be very well depicted. It is very well depicting the cone. * * * * * [20,786]

The Witness: Along the northwest side of Fresno, and in Fresno, northwest Fresno. I think that that purple line, representing the surface cone boundary, might be perhaps a half or three-quarters of a mile farther south than it is.

The Court: Well, do you want to take that black pencil——

Mr. Rowe: Do you want to draw it with the black pencil?

The Court: Connect it with the other one.

Make it heavy, so we can see it.

(Witness drawing on exhibit.)

Mr. Rowe: And put the date and your initials on that black line.

(Witness marking on exhibit.) [20,788]

* * * * *

Q. (By Mr. Rowe): In your opinion, how long has the San Joaquin been degrading? You can put limits on that, minimum and maximum.

The Court: In its present channel?

Mr. Rowe: Yes.

Q. How long has it been in its present channel, let's put it that way?

(Testimony of George M. Stanley.)

A. As a minimum, in its present channel, I would estimate 15 or 20 thousand years. [20,792]

* * * * *

Q. (By Mr. Rowe): Now do you agree with or disagree with Mr. Gardner that the San Joaquin as shown by these L-lines did not debouch and run on ridges?

A. I have already stated that I am sure the river at one time was splitting up and running in many distributaries, their paths forming what are ridges today.

Q. And in that particular, where these L-lines run on ridges, you agree or disagree with Mr. Gardner's testimony?

A. Well, that is contrary to his testimony. He did not recognize — I distinctly recall that from reading his testimony — he did not recognize the channels or river pathways ever following those ridges. [20,798]

* * * * *

Cross Examination. * * * * *

Q. (By Mr. Goldberg): ——directing your attention to the area between the Kings and the San Joaquin as shown on Exhibit 249, you will notice that there is a space here where you have not shown any prior distributaries. A. Correct.

Q. I will ask you to tell me how was this area where you have not shown the prior distributaries formed, if it was not an alluvium, by the distribu-

(Testimony of George M. Stanley.)

tion of the smaller streams, Fancher Creek, Dog Creek, and so forth?

* * * * *

A. * * * Now the creeks are there and they are alluviating that land today. [20,805]

* * * * *

A. Let us say that is the natural appearance of it. Now, with the habit of stream paths to alternately degrade and aggrade—everyone knows they shift from doing one to doing the other—there may be times when the stream will have no channel in that broad ridge.

The Court: But the broad ridge would still be evidence of the former flow of the stream?

The Witness: Yes, sir.

The Court: The path of the flow?

The Witness: Yes. [20,813]

* * * * *

Q. (By Mr. Goldberg): So that the San Joaquin cone, as we see it today, is now overlain in part by material from the Kings?

A. Not the Kings. Overlain by the material from Dry Creek.

Q. I see. But do I understand your opinion to be [20,854] that some place, if we exposed the subsurface geology, we would find that the two cones, of the San Joaquin and the Kings, come together at V, as you have indicated it; that if we go down in depth, we would find that V continued, and have a solid block built up by the Kings and a solid block built up by the San Joaquin?

(Testimony of George M. Stanley.)

The Court: Are you prepared to answer that? Your testimony now is limited to the surface.

The Witness: That is right, your Honor.

I would only hazard the opinion that it would be silly to think it would be a perfectly vertical line right on down through. On the other hand, I think it doubtful that there was very much wandering around in the demarcation between them. [20,855]

* * * * *

The Court: And while I think about it, I announced to the record the other day that with relation to the defendants represented by Mr. McPherson, it seemed to me that in view of the fact that the United States was not a party to the suit and the contention of those defendants that the United States was not a party; that the time of service applicable to them would be the same as applicable to any other defendant.

Since that time my attention has been directed to the provision of Rule 12 of the Federal Rules of Civil Procedure, to the effect that any officer of the United States who is a party to an action or suit as a defendant shall have the same time to appear and respond as the United States, which is the 60-day period. [20,859]

* * * * *

Cross Examination

Q. (By Mr. McPherson): Then, when you stated this morning in your direct examination that you were contrary to Mr. Gardner and that he

(Testimony of George M. Stanley.)

[20,865] disregarded the Lee lines where they ran on ridges, you don't know, do you, whether or not Mr. Gardner's opinion was based upon auger borings that he made of those ridges?

A. That is not quite correct. I saw something in the testimony to the effect that he had been making some auger borings, but I saw no results of his auger borings.

Q. Well, you stated, if I understood you correctly—and I want to ask this lead question in order to shorten the cross examination—that you had examined Mr. Lee's cone lines as he had drawn them on Exhibit 30, which was the assembly of quads?

A. Yes, sir.

Q. And that in your opinion those cone lines were drawn correctly with the exceptions that you noted, one in the region of Fresno and one in the area north of the river near Herndon, and that in your opinion they correctly reflected the cone line as it was shown by the surface topography?

A. Yes.

Q. Now did I correctly understand you?

A. I gave the opinion——

Q. I mean, am I correct in my understanding?

The Court: Based on the surface topography?

Mr. McPherson: That is what I said.

The Witness: I think he gave an excellent picture in those Lee lines of—— [20,866]

* * * * *

Q. Then we go back to my original question: Except in those instances where you have made a

(Testimony of George M. Stanley.)

field inspection, are you able to say that Mr. Lee's lines in all instances follow a water laid course rather than running along and over ridges which were wind blown?

The Court: He answered that.

Mr. McPherson: What was his answer, if your Honor please?

The Court: His answer was, in his opinion they were water laid.

The Witness: And I can repeat it.

I feel certain that the places where Mr. Lee has drawn his L-lines as shown by topography are not sand dunes.

The Court: And are water laid, you said.

The Witness: And that they are water laid, that they are the paths of distributary streams. [20,879]

* * * * *

CARL HOBE

recalled as a witness by and on behalf of the plaintiffs, resumed the stand and testified further as follows: [20,902]

* * * * *

"Q. One more question, Mr. Hobe. What do you think they would pump when the river is down to 5 acre-feet, you are pumping more than 5 acre-feet?"

Mr. McPherson: I think probably the "acre-feet" —means second-feet.

The Witness: I believe that was corrected on one of the copies.

(Testimony of Carl Hobe.)

Mr. McPherson: Obviously it was a mistake.

Your answer to that question, commencing on line 16:

"A. I expect that the wells will pump around the same, I don't see why they shouldn't." [20,942]

* * * * *

"Q. Then your desire to get out of our Madera Irrigation District is because your water conditions are good and you prefer to pump, is that it?

"A. Well, that isn't the case so much, it is just so much cheaper, that is all.

"Q. At the present time it is so much cheaper, that is because of the water percolating in from the irrigation and from the San Joaquin River, is that right, over a period of time?

"A. I believe so, yes." [20,943]

Dropping down to line 9:

"Q. You mean by that that it is your belief that the underground water supply there will always be plentiful for you?

"A. I believe it will, yes."

* * * * *

Mr. Rowe: I want to object on the ground it is improper cross examination. It has nothing to do with the wells shown on Plaintiffs' Exhibit 236 or 251.

The Court: It goes to his credibility. That is the sole purpose? [20,944]

* * * * *

Mr. Rowe: And I also want to object on the grounds that it is improper cross examination.

(Testimony of Carl Hobe.)

I only put Mr. Hobe on—and ask that the questions and answers be stricken out—on the well measurements. I didn't put him on on his opinion.

* * * * * [20,951]

Redirect Examination * * * * *

A. 251 and 236? They are, to the best of my knowledge and ability, the correct measurements.

Mr. Rowe: Now, I am going to state to the court I am [20,961] taken by surprise.

Q. Mr. Hobe, the copy that Mr. McPherson cross examined you with is your own personal copy of the evidence, is it not, as shown by your stamp?

(Transcript handed to the witness.)

A. I believe that that is our ttorney's copy, Mr. Rowe, but it does have my name stamped on it.

Q. How did Mr. McPherson get hold of it?

A. Well, Mr. Andrews told me that the Peckinpah law firm called him and asked if they could borrow the transcript of the Madera Irrigation District exclusion hearing.

Q. Now, about a year ago, your attorney, Mr. Andrews, asked to come in and associate himself with me and represent Mr. Rank, did he not, to assist me in the trial of this action?

A. He did offer to.

Q. And he wanted Mr. Rank to pay him?

* * * * * [20,962]

Q. (By Mr. Rowe): Mr. Andrews was turned down by Mr. Rank and myself, was he not?

A. That is correct.

* * * * *

(Testimony of Carl Hobe.)

The Witness: I wanted to explain that Mr. Andrews told me that the contract was taken for the case that is coming up on this matter, your Honor, before the Appellate Court of the State of California.

The Court: Very well.

The Witness: That is why he told me they borrowed the [20,963] transcript.

Q. (By Mr. Rowe): They borrowed the transcript for what reason?

A. They borrowed the transcript for the case that is pending on that matter before the Appellate Court of the State of California.

Mr. McPherson: I simply want the record to show I know nothing of any such arrangement.

* * * * * [20,964]

Mr. Rowe: I stated I am taken by surprise. You ruled that he could testify on opinion evidence, but I didn't put him on for that. I think I am entitled to bring out the facts. I am not particularly bothered, but I just want to know how my opposing counsel operate at least. [20,968]

* * * * *

Q. (By Mr. Rowe): Do you think five second-feet is enough to maintain water at these pumps now after checking the wells further?

Mr. McPherson: We object, and assign the same grounds.

The Court: Overruled.

The Witness: No, I don't, Mr. Rowe. [20,969]

* * * * *

CHARLES H. LEE

recalled as a witness in rebuttal by and in behalf of the plaintiffs, having been previously duly sworn, was examined and testified as follows:

Direct Examination

* * * * * [20,998]

Q. (By Mr. Rowe): Now, referring to Mr. Gardner's chart A-24-A, in your opinion does Well 13-20-7b vary in depth with the flow in the San Joaquin River? And, whatever your answer is, give your explanation.

A. Yes. The water level fluctuates in Well 13-20-7b, reflecting, in my opinion, the fluctuations in the discharge and water level in the San Joaquin River. [21,021]

* * * * *

Q. (By Mr. Rowe): Now, Mr. Lee, referring to wells 13-18-10a and 13-20-7b, and the variation in the water level comparable to the variation in the barometric pressure, what does that indicate as to whether those wells are located on a confined aquifer or a free ground water table or——

* * * * *

The Court: He just got through saying that, in his opinion, it indicated they were in confined aquifers; that if they were in a free ground water table the pressure would be equal throughout, as it is in a river bottom.

The Witness: I would like to state, your Honor, it is more than an opinion. It is the experience of all hydrologists. [21,080]

* * * * *

(Testimony of Charles H. Lee.)

In Roswell, New Mexico, in an artesian basin, it has been observed, and it is a regularly recognized feature of wells where there is confinement and saturation. [20,081]

* * * * *

The test made on December 12, 1952, at 11:55 a.m., at city well No. 39, which had not been pumping but was then started. The elevation of the water level before the pumping started was, in the test hole, 38.17 feet below the surface elevation, 248.67 feet; and the city well No. 39, depth to water 41.50 feet below surface elevation, 246.62 feet.

* * * * * [21,127]

The Witness: Now pumping then continued for six hours and then the City Well No. 39 was stopped.

The elevation of the water level before the pump stopped in the test hole was 38.17 feet to water.

* * * * *

The drawdown in the city well was 11.41 feet and the change in water level in the test hole was .41 of a foot, a lowering of .41 of a foot. [21,131]

* * * * *

Q. (By Mr. Rowe): In other words, Mr. Lee, they encountered water first in the test hole at 29 feet 10 inches and they let the well stand there for 18 hours and it was still 29 feet 10 inches in the test hole? A. Yes.

Q. Then after that——

The Court: Which indicated that it was not a productive sand, is that right?

Mr. Rowe: Well, no. We were testing out the sands.

(Testimony of Charles H. Lee.)

The Witness: It indicated that there was a little water in that sand stratum at that level.

Mr. Rowe: Which stood 16 feet higher than the water in the city well. [21,134]

* * * * *

The Witness: The drawdown in the city well, 11.25 feet. The change [21,138] in water level in the test hole was lowering of 1.67 feet. [21,139]

* * * * *

Mr. Rowe: For some reason the city man didn't measure this on this particular day; but I am going to introduce today the monthly measurements of the city well.

The Court: It is only the city well that is approximated here.

Mr. Rowe: Yes.

The Court: The test hole appears to be definitely stated. "Standing level of water in city well No. 41 approximately 40 feet below that in test hole."

Mr. McPherson: Yes, but it gives the elevation of the water level in the test hole as "approximately 314 feet."

The Court: Above sea level.

Mr. Rowe: Mr. McPherson, the monthly measurements of the city well were made within three days of this test, and the city employee figured that that was good enough, that he didn't have to measure the city well on that day.

So I am going to give you the official measurements of that particular city well, so you can com-

(Testimony of Charles H. Lee.)

pare it, where it hasn't a variance of a half a foot in 90 days.

The Court: All right.

The Witness: Next is test No. 5. Pumped well, Figarden well, west side of Wishon, south of Gettysburg. Depth, 205 feet.

Elevation doorway brick pump house, 317.35.

* * * * * [21,141]

The Court: An auger?

The Witness: Yes, a screw auger.

The test hole was drilled to a depth totaling 75 feet, and very wet soil was found from 62 to 75 feet, but no definite water table was encountered.

The log of the boring is on the second sheet. The formations are as follows:

Depth, 0 to 18 feet, was a sandy loam;

18 to 20 feet, sandy clay loam;

20 to 24 feet, fine sand;

24 to 28 feet, sandy clay loam;

28 to 32 feet, sandy loam;

32 to 38 feet, sandy clay loam;

38 to 52 feet, sand;

52 to 62 feet, sandy clay loam;

62 to 75 feet, clay, wet.

There was no water encountered in that boring.

The Court: Now, the 20 to 24 feet, fine sand, was that capable of carrying water?

The Witness: Yes, your Honor.

The Court: Was all the material down to the wet clay, which was encountered at 62 feet, capable of carrying water?

(Testimony of Charles H. Lee.)

The Witness: Yes, it was all capable of carrying water, but it would not have yielded water in a number of these strata. The sandy clay loams would have yielded water very, [21,150] very slowly.

* * * * *

The Court: Let me see, Well 39 was tested in relation to Well 31 and also in relation to Well 44?

The Witness: Yes, your Honor.

The Court: And that was 4650 feet from Well 39?

The Witness: Yes, your Honor.

The Court: But Well 44 was the one that was pumped, is that right?

The Witness: No, your Honor. Well 44, marked "t" means that that is the test well. Well 39 is the well that was pumped.

The Court: Then after seven hours there was a lowering in Well 44, is that right?

The Witness: Some time after seven hours, yes. The night intervened. The effect had not been felt at 44, Well [21,160] 44, at the end of seven hours but it was at the end of 24 hours so that sometime between seven and 24 hours the effect reached Well 44, but I do not know the exact time.

Q. (By Mr. Rowe): That is why you marked that "7 plus"?

A. Yes, it is marked "7 plus."

Q. In other words, you have two tests on No. 1, one made by pumping 39 and measuring 44 and also [illegible]31?

A. Yes, that is right.

(Testimony of Charles H. Lee.)

Q. Now when you pumped 31, would you read that into the record, how long it took to affect Well 38, and how far it is away?

A. 4700 feet distant from 31 to 38, and the time required to affect it was two hours and five minutes.

Q. Now going over to Well 41 on First Avenue.

A. That well was pumped and the test was made in an irrigation well 1850 feet northwest, and the time required for the irrigation well to be affected was one hour and 40 minutes.

Q. Now test No. 5.

A. Test No. 5 was pumping at the Figarden well and observed the water level in the other well, which is 1900 feet northeast, and the period of time required was one hour and 20 minutes for the well to be affected by the pumping in the Figarden well. That was test No. 5. [21,161]

* * * * *

Test No. 7 is in Section 27 of the same township and [21,162] range. The test well was 530 feet from the pumped well and the time to affect it was two hours.

* * * * *

Test No. 10 was in Section 11——

The Court: Is that below the bluffs or above?

The Witness: That was above the bluff, your Honor.

The Court: Right on the bluff?

The Witness: The pumped well was back of the bluff in Section 11 of Township 12 South, Range 20

(Testimony of Charles H. Lee.)

East, and the test well was very close to the edge of the bluff.

Q. (By Mr. Rowe): And on top of the bluff?

A. On top of the bluff.

Q. And was that the well that was near the cut that you made in the bluff that is labeled No. 1 that the court visited last July?

A. Yes, it is immediately above that cut. And the distance apart of these two wells is 950 feet, and the time required to affect it was 10 minutes.

* * * * * [21,163]

Q. (By Mr. Rowe): Now, Mr. Lee, in your opinion, based on Plaintiffs' Exhibit 259 and the tests made, is there such a thing as a free ground water body existing between city wells 31, 39, 38, 25, and 41 in the city of Fresno, and the San Joaquin River near test No. 10?

The Witness: Will you repeat that?

(The pending question was read by the reporter.)

The Witness: None indicated by these tests.

The Court: Well, in your opinion is there such a thing?

The Witness: It is my opinion there is not.

* * * * * [21,166]

The water which is percolating follows the course of steepest gradient as a law of flow, just as a ball rolling down a sloping board will not roll diagonally across that board but it will follow the line of steepest slope. So the flow of percolating water follows the line of steepest slope. [21,180]

* * * * *

(Testimony of Charles H. Lee.)

Cross Examination * * * * *

Q. (By Mr. McPherson): Did you give any consideration to the possibility of underground storage of this water which was covered by the contracts with the districts labeled Class 1, whether properly so or not?

A. Yes, I considered that the Central Valley Project is based upon a fallacy, the whole plan. The plan is that this surplus water available in the spring months, the late winter and spring months, be spread upon the land and allowed to sink into the land and replenish the underground.

Now there are some favored spots in the San Joaquin Valley which the old settlers selected where the soil was sandy and the water goes in, and there were historic experiences of the rising of the water levels in those areas.

But the great bulk of the land now proposed for irrigation is hardpan land. It does not take water and the water [21,304] that is available in these green areas on this diagram won't get into the soil. It can't possibly get into the soil and be spread out. The streams already have their own runoff. So there is no way of getting that water into the ground. The whole project is based upon a fallacy. * * * * * [21,305]

Q. May I ask you to answer a simple question: Assuming we have established a water table in the sense that you use it in your Exhibit M, which you wrote yourself,—my question [21,343] is a simple

(Testimony of Charles H. Lee.)

one—below that water table, is it not saturated to the basement complex?

The Court: He answered that.

Mr. McPherson: What was his answer?

The Court: His answer was "Yes, it is saturated, but portions of it won't yield water."

Mr. McPherson: All right.

Q. But it is one, and is one only, body of water, isn't it?

Mr. Rowe: I didn't understand that. That is objected to as having been asked and answered.

Mr. McPherson: That is where we got into the hassle before. That is why I had to get that record.

Q. Now, will you answer, is it a single body of water?

A. It is a single body of water, but when pumping is undertaken the water stays behind in the clay, but will be yielded by the sand and gravel, and the water in the sand and gravel layers above the bottom of the well, which are not perforated into the casing, cannot get through to the lower stratum, which are yielding water to the well. [21,344]

* * * * *

Mr. McPherson: I never got an answer to that question or we wouldn't have had all this hassle.

What was his answer? I will accept the court's interpretation of his testimony.

The Court: I am not sure.

(Testimony of Charles H. Lee.)

Mr. Rowe: He said it could be if they were from the same source.

Mr. McPherson: Mr. Rowe, let the witness testify.

* * * * * [21,346]

The Court: Actually what is in dispute here, as I see it, is the amount of water which is the difference between what Mr. Hill said would be sufficient to satisfy all of the underground supply and all of the river supply that could be taken of 50,000 acre-feet, which was his final figure, and the amount that you claim would be necessary to satisfy your Plan of Physical Solution which, as I recall, was approximately 120,000 acre-feet a year.

Mr. Rowe: And further, they can't take water out of a watershed without all the necessary needs in the county and adjacent lands being satisfied.

The Court: If the requirements of the underground are satisfied by the additional 60,000 acre-feet which you claim, then you cannot expect this court to issue an injunction and say you cannot divert any water down the river or say that [22,087] the building of the dam was illegal or diversion beyond that was illegal. The whole question now, it seems to me, is coming down to whether or not the plaintiffs in this case, as a class, are entitled to 50,000 acre-feet a year or, as you say, under your claim 120,000 acre-feet a year. [22,088]

* * * * *

J. E. COBB

called as a witness herein by and on behalf of the plaintiffs, having been heretofore duly sworn, was examined and testified as follows:

The Court: You were sworn heretofore.

Direct Examination

Q. (By Mr. Rowe): Mr. Cobb, how many pumps are you pumping out of the San Joaquin River?

A. Three.

Q. Three; and how many are operating?

A. They are all operating today.

Q. Were they operating yesterday?

A. Part of the day.

Q. Well, have you had trouble, due to breaking of suction,—— A. Yes.

Q. ——at any of the pumps?

And just describe the time the pump was out of commission.

A. Well, it went off during the night, close to a week ago, and run empty all night.

The next day it run until along in the afternoon, and quit again, and run idle until I came in at night and shut it off. [22,600]

The next day——

The Court: When did you say, yesterday?

The Witness: No. That has been two or three or four or five days ago. I don't remember what day. Then they laid it off one day——

Q. (By Mr. Rowe): Had it shut down one day?

(Testimony of J. E. Cobb.)

A. Had it shut down one day, wasn't there to watch it.

Q. Were there irrigators there working, using that water?

A. There were, when it would run.

Yesterday the Bureau came and put some floats over them, and they were both working. They got a bulldozer down there—I don't know just what they intend to do. They talked about cutting the pipe and putting a coupling in, and digging it out some more. I don't know what it is going to be, whether they are going to put a dam in, or dig it out again.

Q. Do you know whether the activities of the Bureau with the present flow in the river will allow your pumps to continue to pump?

A. Well, if they keep digging down and sticking the pipe down it will pump as long as there is any efficiency, then it will have to be a different kind of a pump.

Q. Do you know, with this flow in the river, whether [22,601] they can maintain the water in the pump?

A. Well, if they put the dam back that they had in one time, and it don't sand up, it will maintain it temporarily.

The trouble is the dam they put in before, when it washed out the water is going back to the old channel now, and the pump is setting on the bottom, sanded up a little.

It is impractical, the way they do it. I don't

(Testimony of J. E. Cobb.)

want them to put it down in the sand again. I took the pump away, it was filled with rocks. We have a pump setting on the bottom. If they cut the pipe and lower it and dig a hole, and the thing is going to have to be done until you put in another pump. I think the channelization is temporary, and they have to keep digging.

Q. Have they started any channelization in the river? A. No. [22,602]

* * * * *

Q. You are raising what kind of crops this year?

A. Cotton and corn.

Q. How many acres of cotton?

A. 100 acres of that.

Q. And how many acres of corn?

A. 80 acres of corn.

Q. What is that, eating corn? [22,603]

A. No, hog feed, chicken feed.

Q. And you said the pump had failed, for lack of supply, as much as a day at a time?

A. Yes. [22,604]

* * * * *

Mr. Rowe: In view of Mr. McPherson's statement, I would ask the court, or I will move—I will file a motion at this time—that it is my plan to reopen the case.

The Court: Do you expect to file a written motion for service of process upon the Secretary of the Interior under Section 1655?

Mr. Rowe: At this time I do; yes, sir.

The Court: Your oral motion is denied as not being in compliance with the rules regarding service, and the oral motion to dismiss is denied, made by Mr. McPherson, as not being in compliance with the rules.

I will say, incidentally, that I cannot read the opinion of the Circuit Court the way you attempted to interpret it at all. I do not think it is any demand or requirement that I dismiss this case or that I have no jurisdiction.

Mr. McPherson: I did not so state, your Honor. I simply said, as I read the limitation upon the exercise of the court's power as described in the opinion, it would seem to me that the only relief which the plaintiffs could have under their complaint as your Honor construed it in your opinion has been denied him by that opinion. [22,759]

* * * * *

Mr. Goldberg: I have been authorized to appear for the Defendant Officials for the purpose of the pretrial set for this afternoon.

I have a letter from the Department of Justice authorizing me to make this appearance, and I would like, with the court's permission, to read this letter into the record at this time.

The Court: You may do so.

Mr. Goldberg: Thank you.

This appears on the letterhead of the Department of Justice, Washington, December 1, 1954, air mail special delivery:

"B. Abbott Goldberg, Esquire
"Deputy Attorney General
"State of California
"The Californian Hotel
"Fresno, California

"Dear Mr. Goldberg:

"This will refer to the case of Rank, et al., v. Krug, et al., in the United States District Court for the Southern District of California, Northern Division, No. 685-ND.

"In accordance with your telephone conversation with the representative of the Department on December 1, 1954, there is transmitted to you the response of the United States of America to the Request for Admissions. You are requested to serve [22,970] the response upon Mr. Claude L. Rowe, counsel for the plaintiffs and complainants in intervention, and counsel for all parties. You are not authorized to act for the United States other than to make the mentioned service of the response. Every safegard is being taken to prevent any admission that the United States of America is subject to the jurisdiction of this court in this action. The United States of America desires to co-operate in every way but must refrain from filing an answer which might be construed as or result in enlarging the issues.

"Under separate cover there are being submitted the answers on behalf of the defendant subordinate officials to the complaints of the plaintiffs and complainants of the plaintiffs and complainants in in-

tervention. You are authorized to file these pleadings on behalf of the subordinate officials, as distinguished from the United States of America, with the Clerk of the Court and to serve copies on all parties. You are likewise authorized to represent the subordinate officials in the pretrial conference to be held on December 3, 1954, making the same objections on their behalf as you will make on behalf of the Irrigation Districts, which you also [22,971] represent, and on behalf of the State of California.

"It will be greatly appreciated if you will advise me of all developments in this matter. You are likewise requested, if a pretrial order is prepared, to submit a copy of it to me for consideration prior to the entry of it on behalf of the subordinate officials.

"Sincerely,

(Signed) "J. Lee Rankin,

"J. Lee Rankin,

"Assistant Attorney General,

"Office of Legal Counsel.

"Enclosure

"No. 151990"

The enclosure referred to, your Honor, is the United States' objection to the request for admissions by Mr. Rowe, and I have filed two copies, the original and one carbon, with the clerk of this court.

I understand that Mr. Rowe received a copy of that in the mail yesterday. I do not have enough copies to serve all counsel, but copies are being prepared.

The answer of the subordinate officials or the answers of the subordinate officials which are referred to in the letter I have not yet received. They have not come to the California Hotel or here at the time of the commencement of [22,972] this session.

The Court: Is there anyone here representing Clyde Spencer, individually and as Supervising Engineer, California Project, United States Bureau of Reclamation, as Regional Director of the United States Bureau of Reclamation, as Director of the United States Bureau of Reclamation, as Director of Region 2, United States Bureau of Reclamation?

Mr. Goldberg: It is my understanding that the letter which I read, your Honor, is an authorization to appear on behalf of all the subordinate officials who remain parties to this proceeding.

The Court: Is there anyone here representing Martin H. Blote, individually and as Watermaster, United States Bureau of Reclamation, and as Superintendent of Operations of the Central Valley Project, United States Bureau of Reclamation?

Mr. Goldberg: And the same answer as to Mr. Blote, your Honor.

The Court: And Mr. Sullivan, in his individual capacity and as Operations Supervisor, Fresno Operations Office, United States Bureau of Reclamation?

Mr. Goldberg: The same as to Mr. Sullivan.

The Court: The same answer?

Mr. Goldberg: Yes, your Honor.

The Court: Mr. Goldberg, the statutes of the United States Code—I do not recall the section

now—provide that it shall be the duty of the United States Attorney to [22,973] appear in and represent the United States whenever its interests are involved or whenever any of its officials are involved.

Provision is also made for the appointment of an Attorney General, Assistant United States Attorneys and Assistants to the Attorney General.

Are you an official of the United States?

Mr. Goldberg: No, your Honor.

The Court: Are you an Assistant United States Attorney?

Mr. Goldberg: No, your Honor.

The Court: Are you an Assistant Attorney General?

Mr. Goldberg: No, your Honor.

The Court: Are you a Special Assistant to the Attorney General of the United States?

Mr. Goldberg: No, your Honor.

The Court: Are you an employee at all of the Department of Justice of the United States?

Mr. Goldberg: No, your Honor.

The Court: I do not think that I can recognize you, then, as representing these defendants unless you are appearing for them individually. Do you have any request or designation of you as counsel to appear for them individually?

Mr. Goldberg: No. The only request I have, your Honor, is the request which I have just read into the record.

The Court: Very well. I do not think that I can therefore recognize you as representing the Gov-

ernment officials [22,974] I have named, either individually or in their official capacities.

Mr. Goldberg: Very well.

The Court: If they desire representation it will be necessary for them either to have the United States Attorney or an Assistant United States Attorney or someone who is an employee of the United States of America and who has taken his oath as an officer of the United States of America to be specially designated, and who is also a member of the bar, to be specially designated by the Attorney General of the United States as a Special Assistant to the Attorney General.

Are there any other appearances? (No reponse.)

If there are not, we will take up the matter first of the motion to sever. [22,975]

* * * * *

Mr. Rowe: There is no provision in any Act of Congress authorizing the taking of necessary water for domestic and agricultural purposes, for the use of generating hydroelectric power.

So I think the issues are very much dissimilar. The issues involving the other irrigation districts have to do with the taking of water for agricultural purposes, in one case for domestic purposes and, furthermore, the only right that the defendant Pacific Gas & Electric Company would have to take water would be if the Government of the United States has authority and the title to the water. Their rights depend entirely on the rights of the United States and of the defendant officials as evi-

denced by the defendant officials and the State of California in this regard having already been given.
* * * * * [22,979]

The Court: Very well. I have ruled that the United States is already a party to this suit.
* * * * * [22,985]

The Court: Are you ready to proceed in connection with the pretrial order made on the 23rd of November, 1954, which reads as follows (and which order was made of the court's own motion):

"It Is Hereby Ordered that a Pretrial Conference under Rule 16 of the Federal Rules of Civil Procedure will be held in the above-entitled case on December 3, 1954, at the hour of 2:00 o'clock p.m. on said day, in the courtroom of the United States District Court in the Federal Building at Fresno, California, at which time the court will expect counsel to discuss and state their position as to:

"a—The pretrial order of January 17, 1952, in light of the pleadings as they presently exist and the evidence admitted since the date of the pretrial order;

"b—The names of all witnesses to be called on the case as reopened and reset, and the subject [23,002] matter of their testimony;

"c—The evidence and order of proof for and against parties added since July 1, 1953, and upon the pleadings as they presently exist;

"d—Such other matters as may properly come before the court and may aid in the disposition of the action.

"It Is Ordered that counsel for the parties be present at said proceeding and on said date and hour, and

"It Is Further Ordered that the clerk of this court forthwith send a copy of the within order to counsel of record, and specifically shall send a copy of the within order to the United States Attorney for the Southern District of California, at Los Angeles, and to the Attorney General of the United States, by registered air mail, and shall file a certificate of such mailing in the case.

"Dated: Los Angeles, California, November 23, 1954." [23,003]

* * * * *

Mr. Rowe: On September 18, 1953, this Court made its written order granting the motion to make the United States a party defendant in the main case of Rank v. Krug, and in the complaints in intervention of the City of Fresno and the Tranquillity Irrigation District.

On December 14, 1953, the United States of America moved to dismiss.

The Court: Does the record show service of the complaints and complaints in intervention and process as required by the order?

Mr. Rowe: The record shows the service, legal service of the complaints in intervention of the City of Fresno against the United States——

The Court: And Tranquillity? [23,007]

Mr. Rowe: And Tranquillity.

The Court: And the plaintiffs?

Mr. Rowe: Yes.

The Court: And the summons?

Mr. Rowe: Yes, summons was issued and properly served in accordance with the rules, Federal Rules of Civil Procedure of the United States between September 18, 1953 and December 14, 1953.

On December 14, 1953, the United States of America filed a written motion to dismiss the complaint against itself, and the complaints in intervention of the City of Fresno and the Tranquility Irrigation District.

On January 11, 1954, those motions were argued in open court by attorney for the plaintiffs, complainants in intervention, City of Fresno and Tranquility Irrigation District, and by attorneys representing the government of the United States.

On January 30, 1954, this Court made its written order denying the motion of the United States of America to dismiss the complaint against it, and the complaint in intervention of the City of Fresno and the Tranquility Irrigation District, and giving the United States of America sixty days to answer the—I am not sure whether it is sixty or thirty days, but giving the requisite time for the United States of America to answer the complaint on file in Rank v. Krug [23,008] and the complaints in intervention of the City of Fresno and Tranquility Irrigation District.

Prior to the expiration of that time, I don't know the exact date, but I have it somewhere, the United States of America filed another writ of prohibition and writ of mandamus to prohibit this Court from acting further in this case.

On June 4, 1954, the Ninth Circuit Court of Appeals denied the petition for writ of mandamus and prohibition filed by the United States of America against this Court.

The United States of America has never answered either the complaint on file herein in the main case of Rank v. Krug, or the complaints in intervention of the City of Fresno and the Tranquility Irrigation District, and as I understand the law, the United States of America is in default, having failed to answer the complaint and the complaint in intervention. [23,009]

* * * * *

By my view, under the rules of the Federal Rules of Civil Procedure, the United States of America is in default under this new amendatory and supplemental complaint.

Then a series beginning in February of what the government of the United States entitled "Suggestions" were filed in this Court. However, legally a suggestion only goes to the question of jurisdiction, but the suggestions filed by Mr. Rankin and Mr. Veeder went much further and probably constitute an appearance, especially the one that requests the plaintiffs and complainants in intervention to file an amended pleading. We conformed to that suggestion of the United States of America. They have never answered the amendment.

The United States of America followed with a number of suggestions. Then plaintiffs and complainants in intervention filed a request for admissions, answer to which I have just received, which

in my opinion clearly is an appearance in this case by the United States of America. They may object to the jurisdiction, but they are now taking [23,010] part of the evidence in the case.

The Court has ordered the trial reopened for Tuesday, and in view of the suggestion of the Ninth Circuit Court of Appeals the motion to reopen was made, primarily for the purpose that possibly the United States would want to cross examine the plaintiffs' and complainants' in intervention witnesses, and might want to introduce evidence on behalf of the United States.

In accordance with that suggestion of the Ninth Circuit Court of Appeals, I will offer Tuesday the witnesses for cross examination used by the plaintiffs and complainants in intervention heretofore in this action. [23,011]

* * * * *

The Court: All right. Are there any other statements counsel have to make in connection with the pre-trial?

Mr. Goldberg: Yes, your Honor. Preliminarily, Mr. Rowe says he is going to offer some additional evidence, if I understand correctly, additional evidence on behalf of the City of Fresno and on behalf of the Tranquillity Irrigation District.

The Court: And the plaintiffs, he said.

Mr. Goldberg: And the plaintiffs. My understanding of the purpose of the pre-trial is that the nature of the evidence will be discussed. We all know they would not ask for the reopening of the trial if they were not going to [23,015] offer addi-

tional evidence. In that way we might, even at this late date have some opportunity to prepare to meet it and perhaps shorten the subsequent proceedings.

The Court: The additional evidence?

Mr. Goldberg: Yes. We could prepare to meet it. [23,016]

* * * * *

The Court: For the following Districts, Terra Bella, Porterville, Exeter, Delano-Earlimart, Lindsay-Strathmore, Ivanhoe, Lindmore, Orange Cove, Saucelito, Stone Corral, Tulare and Lower Tule River—Mr. Abercrombie? (No response.)

Mr. Goldberg: I am appearing instead of Mr. Abercrombie today.

* * * * *

The Court: Mr. Goldberg, in your capacity as Deputy Attorney General of the State of California?

Mr. Goldberg: Yes, in the capacity in which we have been associated with Mr. Abercrombie heretofore. [23,046]

* * * * *

The Court: The United States of America? (No response.) Is there an appearance for the United States of America? (No response.)

There is none.

* * * * *

Mr. Goldberg: Omitting the telegraphic symbols, it is as follows:

"B. Abbott Goldberg, Deputy Atty. General, State of Calif.

"Hotel Californian, Fresno Calif.

"Re Rank, et al. v. Defendants Spencer, Blote, [23,048] Sullivan, This Is Your Authority to Represent The Named Defendants In The Trial to Reopen Dec. 7. You Are Not Authorized to Represent United States.

"J. Lee Rankin, Asst. Atty. General, Office of Legal Council, Wash., D.C." [23,049

* * * * *

The Court: There was placed on my desk a few moments ago documents which indicate that they were received late yesterday by the clerk. [23,051]

* * * * *

The Court: One document is entitled Answer to Complaint in Intervention and Supplemental Complaint in Intervention of Spencer, Blote and Sullivan to the Tranquillity Irrigation District Complaint in Intervention and Supplemental Complaint in Intervention, and another one entitled Answer to Complaint in Intervention, and Supplemental Complaint in Intervention signed J. Lee Rankin, on behalf of Spencer, Blote and Sullivan, to the Complaint in Intervention and Supplemental Complaint in Intervention of the City of Fresno, and another document entitled Answer to Supplemental Complaint signed J. Lee Rankin, to the Supplemental Complaint of the plaintiffs, another document entitled Suggestion of the Attorney General of the United States of various things, another doc-

ument entitled Suggestion in Connection with Response to Request for Admissions, having attached to it a copy of the request for admissions which were received and filed last week without any conditions whatsoever. [23,052]

* * * * *

The service of process upon all of these parties whose answers were received this morning was completed long ago. * * * * *

Incidentally, the suggestions with relation to suggestion in connection with response received this morning and filed yesterday is made with relation to response which was filed December 3rd unconditionally except those contained generally at its beginning and those made with relation to each of the requests as they are enumerated in the response. That was filed and received December 3, 1954.

* * * * * [23,053]

Mr. Rowe: Your Honor, for the purposes of the record, the United States is not present—and I will come to that feature later—but for the purpose of the record I would like the record to show, and have the court confirm me, that I have present in court the following witnesses heretofore sworn in this action—and I will ask them to stand up so that the court may bear me out—Mr. A. Segel, Mr. James Ross, Professor George M. Stanley, Mr. Charles H. Lee, Everett Rank, J. E. Cobb and Lawrence Cobb.

The Court: You may be seated.

Mr. Rowe: That they are here in accordance with the suggestion of the Ninth Circuit Court of

Appeals for the purpose of submitting themselves to cross examination by the defendant, the United States of America.

* * * * *

Mr. Rowe: No, I will later on, but I cannot offer evidence, but in accordance with the record I want it shown that they were brought here and were available at this time for purposes of cross examination, even though they didn't offer any further evidence.

The Court: At this time?

Mr. Rowe: I will take the step of the offering of evidence later, but the Ninth Circuit of Appeals in its decision rendered June 4, 1954, suggested that the Government of the [23,055] United States be given the opportunity to cross examine plaintiffs and complainants in intervention, the City of Freno and Tranquillity Irrigation District, witnesses, and they are here and offered for cross examination by the defendant the United States of America after notice of reopening of the trial and after service upon them of the order of this court on November 18, 1954, reopening the trial for such purpose.

May I ask that the court confirm in the record the presence of these gentlemen?

The Court: The record will note that each of the gentlemen whom you have indicated are present. The court would also note for the record that each and all of them were called and testified on the plaintiffs' case in chief and on the case in chief of the complainants in intervention, the City of Fresno and Tranquillity Irrigation District.

Mr. Rowe: I would also ask the witness Leland Hill and the witness Edwin Sullivan and the defendant Sullivan, if they would please stand. They are here under subpoena.

The Court: I do not think they need to stand.

Mr. Rowe: I offer them to the Government of the United States, the defendant herein, for the purpose of cross examination. [23,056]

* * * * *

Mr. Rowe: I have prepared, before putting on any evidence, I believe in accordance with Rule 55 of the Federal Rules of Civil Procedure and Rule 7 of the Rules of the United States District Court for the Southern District of California, that is it necessary before putting on any evidence against the United States to apply to this court for permission to do so and give a 3-day notice of my application.

I have in front of me such an application, notice and affidavit by myself, as required by the Federal Rules of Civil Procedure. * * * I will serve this notice of application and my affidavit in accordance with the rules today, which is sufficient time to allow the court to hear evidence against the United States on next Tuesday. [23,057]

* * * * *

The Court: The case has been regularly set and noticed for today for trial. The United States has not filed any pleading by way of an answer. These answers of the defendants Spencer, Blote and Sullivan are not timely filed.

They are, however, substitute parties defendant. Their predecessors did appear and answer. And it is

not necessary for me to make a determination now whether or not the United States has appeared in this action.

I will say that I am offhand inclined to the view that it has already appeared, although it has filed no answer.

Under the rules if there is an appearance there is one procedure for default, if there is no appearance there is the necessity for the 3-day notice of the request for default judgment and hearing. And in view of the fact that it would be necessary, because there is no appearance on the trial for these answering official defendants, to abide that provision of the rule, and that you are giving that notice, it is unnecessary for me to make a determination at this time judicially as to whether or not the United States has or has not appeared. [23,058]

* * * * *

Mr. Rowe: There is another thing that has occurred. I anticipated that the Bureau officials would be legally represented today. I will today file a second application with this court covering the defendant Bureau officials, and I reserve the right—just so the record is clear—to move to strike the so-called answers of the defendant officials of the Bureau of [23,059] Reclamation on several grounds.

First, I do not believe their counsel has ever been granted the privilege of practicing in this court; secondly, under the rules I believe they come in bound by the pleadings of their predecessors and bound by the evidence—that is the clear weight of

authority—and, third, their answers are long overdue. [23,060]

* * * * *

The Court: Counsel has handed me, and I will return it to him now—I have examined them—what he designates as a Notice of Intention to file for a default judgment against the United States.

You will file that together with your written request.

Mr. Rowe: Yes, written application.

The Court: For default judgment as to the United States and as to the defendants? [23,061]

* * * * *

Mr. Rowe: I am very much exhausted, it may be a trick of my eyes, but this morning I got to thinking it over after I left, and if I could have that original telegram read by Mr. Goldberg, unless my eyes are confused was that not sent by Mr. Rankin from very close to this court?

Mr. Goldberg: No, it is signed J. Lee Rankin, Assistant Attorney General, Office of Legal Counsel, Washington, D. C.

Mr. Rowe: The thing that I thought, possibly I was seeing [23,063] things—(examining telegram) —I don't know how to interpret it, but it would appear to me it was sent from San Francisco. But I would like to put it into evidence.

Mr. Goldberg: I have a line-for-line and word-for-word copy complete with telegraphic symbols which I will offer for filing, in accordance with the court's suggestion this morning, and supply a copy to Mr. Rowe.

The document bears on its second line the legend: "O.SFC888 PD-WUX San Francisco Calif 6 619-PMP-"

What that means I don't undertake to say.

* * * * *

The Court: In any event, that is an exact copy and it will be filed.

Do you wish to file these various documents I have here, Application (motion) for Default Judgment Against Defendant and Defendant in Intervention v. United States of America, Notice of Application Against Defendant United States of [23,064] America, Affidavit of Claude L. Rowe, Notice of Application for Default Judgment Against Defendants and Defendants in Intervention Spencer, Blote and Sullivan, and Application (motion) for Default Judgment Against Defendants and Defendants in Intervention Spencer, Blote and Sullivan, and Affidavit of Claude L. Rowe.

Do you wish those filed?

Mr. Rowe: I do, your Honor.

The Court: The clerk will stamp them filed.

Copies are attached?

Mr. Rowe: They are, signed copies are all in duplicate.

The Court: And you have not completed service of them under the rules?

Mr. Rowe: They are in the mail. I have given Mr. Goldberg a copy here. * * * * *

The Court: I think in view of the fact that the United States is not here and not represented, has not filed any answer, and [23,065] in view of the

fact that the other parties have appeared in the proceedings and that this is an appropriate and proper and I think a required proceeding under the Federal Rules of Civil Procedure, in order to proceed in default, that it will be necessary for me to continue all the remaining matters * * * * *

Mr. Rowe: I will offer all of my witnesses for cross examination and I will use those witnesses, I am sure, briefly next Tuesday. [23,066]

* * * * *

The Court: The clerk I note here has:

Motion to strike objections of defendant and defendant in intervention the United States of America to plaintiffs and complainants in intervention, the City of Fresno and Tranquillity Irrigation District, request for admissions by said defendant and defendant in intervention United States [23,074] of America;

Application for default judgment against defendants and defendants in intervention Clyde Spencer, Martin Blote and Edwin F. Sullivan, on plaintiffs' complaint as amended and supplemented and upon complaints in intervention as amended and supplemented, of the City of Fresno and Tranquillity Irrigation District;

And application for judgment against defendant United States of America on plaintiffs' complaint as amended and supplemented and upon complaint in intervention of the City of Fresno as amended and supplemented and upon complaint in interven-

tion of Tranquillity Irrigation District as amended and supplemented.

You may proceed, Mr. Rowe. [23,075]

* * * * *

Mr. Rowe: Take, for example, the one "Suggestion in Regard to Motion for Default of Defendants Spencer, Blote and Sullivan," in paragraph 1 Mr. Veeder states:

"1. Information has been received but service has not been made as of this date of a motion to default the named defendants Spencer, Blote, Sullivan in the subject case."

The same statement is in the "suggestion" in regard to the motion to default the United States of America, paragraph 1 of which reads as follows:

'1. Information has been received but service has not been made as of this date of a motion to default the United States of America in the subject case."

They are both dated December 11th. I had the post office get the return receipt signed which shows that they were signed by the Department of Justice in Washington on the 9th day of December, two days before Mr. Veeder made that statement.

* * * * *

The Court: We will proceed with the application for default judgment against the defendants officially and individually and against the United States and with the reopening of the trial.

* * * * *

The Court: I am going to proceed with the trial this morning. I will fix the time for hearing on these as at 10:00 o'clock next Tuesday, December

21st, but in the meantime I will proceed as if they were on file and had been regularly filed. Your motion to strike can be decided later.

They have been served with notice of trial, notice of [23,084] application for default, notice of continuance and process in the case. [23,085]

* * * * *

The Court: Let us get some evidence here, then. The rules say that I cannot grant any judgment against the United States upon default or its officials unless it be on evidence satisfactory to the court. And you are proceeding to put your evidence on now under the order reopening the trial and on the motions for default?

Mr. Rowe: That is right, I am. * * * * * [23,086]

LELAND K. HILL

called as a witness by and on behalf of the plaintiffs under Rule 45(b), having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Leland K. Hill. [23,088]

* * * * *

The Court: I take it that all of your evidence, everything that you are putting on, is against all defendants from now on. [23,097]

* * * * *

The Court: As a matter of fact, let me ask you this question: Mr. Hill, if all of the questions were asked of you at this time which have previously been asked of you during the course of this trial,

(Testimony of Leland K. Hill.)

would your answer be the same today as it was when it was given?

The Witness: Yes, sir, it would be. [23,105]

The Court: Mr. Rowe, if you are going to localize it, he has now said that he would answer all of the questions the same if they were asked him today as he answered them before.

Mr. Rowe: All right. That is all. [23,106]

* * * * *

CHARLES H. SORTOR

called as a witness by and on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination

Q. (By Mr. Rowe): Mr. Sortor, you have testified heretofore in this trial, have you not?

A. Yes, I have.

Q. And if the same questions were asked you that were asked at the time——

The Court: If all of the same questions were now asked you that were previously asked you in this trial would your answer be the same today as it was at the time your answer was given and the questions were asked?

The Witness: It would, your Honor. [23,108]

* * * * *

Mr. Rowe: Mr. Eldridge Morse.

ELDRIDGE H. MORSE

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Your full name, please?

The Witness: Eldridge H. Morse. [23,109]

* * * * *

Mr. Goldberg: My recollection is that Mr. Morse was on the stand only last week.

You were here last week, were you not?

The Witness: No.

Mr. Rowe: Yes, he was offered for cross examination.

The Witness: I was here last week. I wasn't on the stand last week.

The Court: You are employed by?

The Witness: Security Title Insurance Company.

The Court: Very well.

Direct Examination

Q. (By Mr. Rowe): Mr. Morse, I show you Plaintiffs' Exhibits 4 to 25 and calling to your attention those that were issued from the Fresno office of the Security Title Insurance and Guarantee Company, if the same questions were asked you as of the date of those reports would you give the same answers?

The Court: Just a moment, now. Your question is whether or not he would today have testified then

(Testimony of Eldridge H. Morse.)

or whether or not he would testify today as he testified then?

Mr. Rowe: No, my question was, would he testify as of the date he testified before the same way. In other words, was his testimony at that time true.

The Witness: Yes, sir.

Mr. Goldberg: Did you answer yes? [23,110]

The Witness: Yes.

Mr. Rowe: In other words, your Honor, I will have to bring these up to date with some of the owners. I do not have unlimited funds.

The Court: Proceed.

Q. (By Mr. Rowe): If all of the questions were asked of you at this time that were asked of you at the previous trial would your answer be the same as of the date of the titles? A. Yes.

Mr. Rowe: That is all. [23,111]

* * * * *

ALTON MACON

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Alton Macon.

Direct Examination

Q. (By Mr. Rowe): Mr. Macon, you are a title officer with the Madera branch of the Security Title Company, are you not? A. Yes, sir.

(Testimony of Alton Macon.)

Q. And you were heretofore sworn and testified as a witness? A. Yes, sir.

Q. In regard to those reports issued by the Madera office of the Security Title Insurance and Guarantee Company, including Plaintiffs' Exhibits 4 to 25 inclusive?

A. I don't know what the numbers of the exhibits are. [23,112]

Mr. Goldberg: Speak up, Mr. Macon. I can't hear you.

The Witness: I said I didn't know the numbers of the exhibits. He gave me those and I didn't know the exact number.

The Court: The only ones you testified concerning were in Madera County?

The Witness: That is right, sir.

The Court: If all of the questions were asked you at this time that were asked you at that time concerning the matter before the court would your answers be the same as they were then?

The Witness: Yes.

The Court: Except for any subsequent changes of title which have occurred since your previous testimony.

The Witness: That is correct, sir.

Mr. Rowe: That is all.

The Court: Cross examine.

Mr. Goldberg: No questions.

The Court: Witness excused. [23,113]

* * * * *

JAMES EDWIN COBB

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Will you state your name in full.

The Witness: James Edwin Cobb.

Direct Examination

Q. (By Mr. Rowe): Mr. Cobb, you have heretofore testified in this action, [23,114] have you not?

A. I have.

Q. If the same questions were asked of you that have been asked you heretofore on the stand today would you give the same answers?

A. I would.

Q. And has there been any change in ownership of your land since Mr. Eldridge Morse testified?

A. No.

Mr. Rowe: That is all.

The Court: Cross examine?

Mr. Goldberg: No questions.

* * * * *

LESLIE L. HOWARD

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Leslie L. Howard.

Mr. Rowe: I will withdraw him.

The Court: You do not wish to put him on at this time?

Mr. Rowe: Yes, I will ask him the question since he is here.

The Court: Very well. [23,115]

Direct Examination

Q. (By Mr. Rowe): Mr. Howard, has there been any change in ownership of your land since January 1, 1952? A. There has not.

Mr. Rowe: That is all.

The Court: Cross examine.

Mr. Goldberg: No questions.

Just a moment, if the court please.

Cross Examination

Q. (By Mr. Goldberg): Mr. Howard, are you a plaintiff in this proceeding? A. I am.

Mr. Goldberg: I have no further questions.

The Court: Step down.

* * * * *

LAWRENCE D. COBB

called as a witness by and on behalf of he plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Lawrence D. Cobb.

Direct Examination

Q. (By Mr. Rowe): Mr. Cobb, you have heretofore been sworn and testified [23,116] in this action, have you not? A. Yes, I have.

Q. If you were asked the same questions that you were heretofore asked on the stand today would you give the same answers? A. Yes.

Q. One other thing: During the past year have you had any trouble with your pump pumping from the river?

A. Yes, we have had considerable trouble. We had water but we had a lot of trash with it from the channelization that caused a lot of trouble with the pumps. We had to tear them down every so often to clean them up.

The Court: They were sanding up?

The Witness: Not sand as much as trash. They channelized the river and cut into the bank, which has been accumulating for years, and every so often it would cave in and get into the pumps, and we had to tear them down and clean them out several times during the season.

Q. (By Mr. Rowe): Has the bottom of the

(Testimony of Lawrence D. Cobb.)

river raised or lowered at your pump since you last testified?

A. Oh, it has lowered. I wouldn't know exactly how much, but it is continually lower right along, a little every day I think.

Q. How much since you last testified, say in the last [23,117] year, 1954, has the bottom of the river lowered at your pump?

A. Well, I wouldn't know in the last year how much. I haven't measured it, and it looks to be two to three feet, possibly more. I haven't right at my pumps run any measurements but it is way lower than it was.

Q. How many times during 1954 did you have trouble with your pumps, making it operate?

A. Well, I didn't keep track of the times. The fellows that were using it done the work of cleaning it up, and I would just have to make a rough guess at that. I imagine at least 10 times during the season. [23,118]

* * * * *

JAMES EDWIN COBB

resumed the stand and testified further as follows:

Direct Examination

Q. (By Mr. Rowe): Mr. Cobb, during the year 1954 have you had any trouble with your pump breaking suction?

A. Oh, yes, it broke suction several times.

(Testimony of James Edwin Cobb.)

Q. Was it possible to operate your pump at night during the year 1954?

* * * * *

Q. And it would run all night without pumping water?

A. Whenever it quit, if it was in the afternoon or night. Of course if it was in the daytime it was usually [23,119] caught up with and stopped, but at night at different times when nobody was there it would run empty.

* * * * *

Cross Examination

Q. (By Mr. Goldberg): Mr. Cobb, have you had water all during the time since you last testified?

A. Sure, there has been water in the river but it wasn't very practical to use——

Q. Just answer the question. Have you had water? A. Yes, we had water.

Mr. Goldberg: I have no further questions.

The Court: Step down. [23,120]

* * * * *

GEORGE M. STANLEY

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: George M. Stanley. [23,123]

* * * * *

Mr. Goldberg: If the Court please, as far as I can tell, from the index which the Court has pre-

(Testimony of George M. Stanley.)

pared of exhibits [23,124] introduced by Mr. Sortor, this is all the exhibits with regard to which Mr. Sortor testified. However, since Mr. Sortor testified that he would answer all the questions he was asked the same way, I will now move all the exhibits with regard to which Sortor testified be included, whether they have been included in Mr. Rowe's offer or not.

Mr. Rowe: That is all right.

The Court: The offer by Mr. Rowe to introduce into evidence against the United States and against the defaulting officials is granted, and the motion of Mr. Goldberg to introduce all other exhibits concerning which Mr. Sortor testified is also admitted in evidence.

Mr. Goldberg: Yes, all other exhibits previously testified to by this witness.

The Court: By Mr. Sortor.

Mr. Goldberg: Yes, you are right, your Honor.

The Court: In other words, the long and short of it is that you both want all of Mr. Sortor's testimony in, which would necessarily include the exhibits concerning which he testified.

Mr. Goldberg: That is correct, your Honor.

The Court: And that is the order of the Court, whether specifically designated or not.

Mr. Goldberg: And it applies to all witnesses, the same desire on my part to introduce all the exhibits applies to [23,125] all the witnesses who have heretofore testified, who have testified to date, especially with regard to Mr. Hill.

(Testimony of George M. Stanley.)

The Court: It will be the same order.

Mr. Goldberg: Thank you.

The Court: The testimony would be unintelligible without the exhibits.

Mr. Goldberg: That is correct, your Honor, and that is why I am making this offer.

Mr. Rowe: Mr. Hill was called as an adverse witness.

The Court: Why don't you offer all the plaintiffs' exhibits?

Mr. Rowe: I will at this time, and if you want to offer the defendants' exhibits,—I will offer all of the plaintiffs' exhibits at this time.

Mr. Goldberg: I think the offer should be of all the exhibits offered by any party which have heretofore been received in evidence, that they may now be received in evidence.

Mr. Rowe: That is all right. I mean, provided it is shown they are offered by the party offering them.

The Court: Well, there is nobody here representing—You can offer them all for the State, if you wish.

Mr. Goldberg: Surely. [23,126]

The Court: Then Mr. Rowe offers all the exhibits in evidence that were heretofore admitted in evidence at this time against the United States.

Mr. Rowe: I offer all the exhibits of the plaintiff.

The Court: All of the plaintiffs' exhibits heretofore admitted in evidence to be in evidence at this

(Testimony of George M. Stanley.)

time as against the United States and against the defendant officials.

Mr. Rowe: That is right.

The Court: You offer on behalf of the State of California and——

Mr. Goldberg: And the districts which I represent.

The Court: ——and the districts which you represent, all other exhibits which have heretofore been received in evidence. They are admitted.

Mr. Rowe: Subject to any objection of counsel made at the time. Isn't that right, Mr. Goldberg?

* * * * *

Direct Examination

Q. (By Mr. Rowe): Professor Stanley, you have heretofore been sworn and testified in this case, have you not? A. I have. [23,127]

* * * * *

The Court: Except for those two corrections, if each question were asked you at this time that was previously asked you in this trial, your answers would be the same today as previously given?

The Witness: Yes, your Honor. [23,129]

* * * * *

OTTO W. PETERSON

called as a witness by the plaintiff, having been first duly sworn, testified as follows: [23,130]

The Clerk: State your full name, please.

The Witness: Otto W. Peterson, s-o-n.

The Clerk: Have that seat, please.

Direct Examination

Q. (By Mr. Rowe): Mr. Peterson, you have heretofore testified in this action, have you not?

A. Yes, sir.

Q. If the same questions were asked you that were asked heretofore at the trial, would you give the same answers, and if you would not give the same answers, you might state the exceptions. Would you give the same answers? You can answer me.

A. Yes, sir, I would give the same answers, except as to the washout of a portion of the American River Dam, and as to certain costs of the construction of the fourteen check dams, and their operation. [23,131]

* * * * *

Q. (By Mr. Rowe): No. As you gave it at the time, and then what it would cost today to construct those.

A. At the time of my previous testimony, I estimated the cost at $1,072,286. At the present time I estimate the cost of the 14 check dams, fully equipped with Gantry cranes, at $1,124,536.

Q. What would be the cost of the operation of the dams?

(Testimony of Otto W. Peterson.)

A. The cost of operation, the annual cost of operation of the dams would be $4,000.

Q. And what did you testify before?

A. In my original testimony I testified to $5,400 as the annual cost.

Q. Do you care to show the items, the increase in cost in the check dams, 14 check dams?

A. Yes, I will. In the 14 check dams the items were, the concrete has an increase of $11,000, the Gantry cranes of $21,000, and an item that has been put in for track for Gantry crane totaling $20,250, a total addition of $34,000—well, those are the items and that makes the new total.

The Court: That is a total addition of twenty-forty, [23,135] fifty-two thousand. Concrete $11,000.

The Witness: $11,000, $21,000 for the Gantry crane, and $20,250 for track, making a total of $52,250.

The Court: Very well. You said your testimony would be different as to the washout of the American River head dam.

The Witness: Yes, sir.

The Court. By the head dam, that was——

The Witness: Out from Placerville and below El Dorado Power House.

The Court: Was that the wooden dam you testified to?

The Witness: Yes, sir. That went out just before I retired from the company and when I was very busy with other matters, that is part of it, about 20 or 25 per cent, and I testified that there

(Testimony of Otto W. Peterson.)

had been no washout of that dam. I was in error to that extent. The dam was then 47 years old, a good part of it, and was ready for replacement, so while it could have been restored and continued, the proper thing to do was to rebuild the entire dam, which was done.

Mr. Rowe: That is all. [23,134]

* * * * *

The Court: By the way, the transcript is showing that each one of these witnesses is sworn, is it, Miss Reporter?

The Reporter: Yes, sir.

Mr. Rowe: And it is also understood that this testimony is against both the United States and the defendant officials and employees, Spencer, Blote and Sullivan, in their individual and official capacities.

EDWIN F. SULLIVAN

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Give your full name, please.

The Witness: Edwin F. Sullivan. [23135]

* * * * *

The Court: How long have you been employed by the Bureau continuously? [23,137]

The Witness: About fifteen years.

The Court: So that continues up to the present time?

The Witness: That is correct. [23,138]

* * * * *

(Testimony of Edwin F. Sullivan.)

The Court: Have you been furnishing water to Tranquillity, has the Bureau been furnishing water to Tranquillity?

The Witness: Yes, we have.

The Court: Out of the pool?

The Witness: Yes.

The Court: How do you arrive at the quantities? [23,151]

Q. (By Mr. Rowe): For the first 12 per cent in excess of 1360 second-feet measured at Whitehouse, you do not charge Tranquillity, is that true?

* * * * *

The Witness: Do you mean by that question what we have been doing?

The Court: Yes, what you have been doing.

The Witness: During the past year—and I might say that the method has varied in the past years because it has been going on for, I don't know how long, six or eight years anyhow, maybe longer than that—during the past year it was computed as 12 per cent of the amount in excess of 1360 second-feet that would have reached Mendota Pool in the absence of the operation of various intervening dams and diversions that are not not in operation or by their operation have changed the flow conditions. [23,152]

* * * * *

The Court: Well, then, let me see. The first thing you did was to calculate 12 per cent of the flow of the San Joaquin River in excess of 1360

(Testimony of Edwin F. Sullivan.)

second-feet at Whitehouse, that is the gauging station above Mendota?

The Witness: Yes, that is the last thing we calculate actually. You have to go through all your calculations first before you can get the proper amount. [23,153]

* * * * *

Mr. Goldberg: Mr. Sullivan, is this not correct, that the 1360 cubic second-feet is computed on the hyposthesis that the intervening diversions, such as Gravelly Ford, Aliso and whatever the rest of those canals were, the Miller & Lux canals particularly, on the date as of which you compute the 1360 second-feet, if there is such a date, is the date prior to the time to which the United States acquired the Miller & Lux rights?

The Witness: That is true in the main. Now there are some other adjustments that we have made which I don't know whether they would conform exactly with that date or not, but I think that would be essentially correct.

Mr. Goldberg: The other adjustments are the adjustment for the operations above Friant?

The Witness: Yes. The other adjustments we make are the operation of Friant itself, the operation of Big Creek 7, the Southern California Edison, which was constructed not too [23,154] long ago, and then the modified operation of the Kerckhoff power project, which I believe was constructed a long time ago, but was not operated in a modified

(Testimony of Edwin F. Sullivan.)

way until rather recently, if I make myself clear on that.

Very simply, it originally was attempted to act as a run-of-the-river plant, that is, not to change the flow, and recently, however, they have operated it for power peaking purposes.

Mr. Goldberg: Put it this way, Mr. Sullivan: The 1360 second-feet at Whitehouse that we are now talking about doesn't refer to 1360 second-feet in actuality, but refers to a hypothetical 1360 second-feet that might have been there?

The Witness: Yes, that is correct.

The Court: Substantially prior to the acquisition of the Miller & Lux rights?

The Witness: Yes.

The Court: Then after you acquired—go ahead.

Mr. Rowe: Pardon me.

The Court: After you figure out what that excess would be you take 12 per cent of that excess, and what happens to the 12 per cent? That is delivered to Tranquillity without charge?

The Witness: Yes. The basis of that has been that for the purposes of operation in order to have some agreement with them we have to operate as we go along, that we would be willing [23,155] to give them that in exchange for their water rights for this particular year.

Now I don't feel it is proper to testify that that is their entitlement. It is just what we have done for operations for the particular year.

(Testimony of Edwin F. Sullivan.)

The Court: And that has been substantially so since the first diversions from Friant?

* * * * *

Q. (By Mr. Rowe): Mr. Sullivan, as I understand you figure what the natural flow of the river would be into Mendota Pool after taking out Gravelly Ford, Aliso, or what they formerly got, Gravelly Ford, Aliso, the Edison Securities, Chowchilla Canal and the Columbia Canal and the pumpers on the river, is that the way you figure the basis of whether 1360 second-feet is coming into Mendota Pool?

A. I don't recall whether that is the complete list or not. Your statement is not entirely correct because it is not the natural flow, it is the flow after modification by a [23,156] major portion of the present Southern California Edison projects up there, Shaver, Huntington, and so forth.

Q. What you are taking then is the adjusted flow at Friant due to the operation of the Southern California Edison Reservoirs, the Pacific Gas & Electric Corporation Reservoirs, less the diversions that were formerly made by Gravelly Ford, Aliso, Edison Securities, Chowchilla and Columbia, and I believe the Firebaugh Canal, is that the way you would figure it in determining what the flow of 12 per cent of 1360 second-feet at Whitehouse is?

A. Would you give me again those ones that you say were deducted?

Q. Let me put it this way——

(Testimony of Edwin F. Sullivan.)

The Court: All of the power dams above Friant, is that not right?

Mr. Rowe: Yes.

The Court: Which were completed before the Miller & Lux contract.

The Witness: Yes. We assume flow conditions with them in operation.

The Court: As of the date immediately prior to the Miller & Lux contract? I understand there have been some dams built subsequently.

The Witness: Yes. Of course we take into account the flows as they change them at the present time. [23,157]

The Court: I understand that.

The Witness: Yes.

The Court: But to get your hypothetical flow you assume that the flow past Friant would be the same as it was before the acquisition of Miller & Lux?

The Witness: Yes, that is correct.

The Court: And then——

The Witness: The two corrections that we make for that upstream are on the Kerckhoff power plant and on the Big Creek 7.

The Court: Then between Friant and Mendota Pool you assume the diversions would be made that were made immediately prior to the Miller & Lux contract, is that right?

The Witness: Yes, that is correct.

The Court: Now those are—what are the names?

Mr. Rowe: Gravelly Ford, Aliso, Edison Secu-

(Testimony of Edwin F. Sullivan.)

rities, Chowchilla, Columbia and Firebaugh Canals.

The Witness: Well, the Columbia includes the former diversion into the Mowry Canal and Lone Willow Slough. There also, as I understand it, was a Lone Willow Slough grass lands right. The Firebaugh Canal is not deducted since that is in Mendota Pool. And then of course the natural channel losses and the diversions by the riparian users along the river is also deducted. [23,158]

* * * * *

The Witness: The diversions by riparian users and the channel losses, the diversions by the Columbia Canal Company, the diversions which would have been made by the Lone Willow Slough grass lands rights, and the diversions which would have been made by Gravelly Ford, those which would have been made by Aliso and those which have been made by Edison Securities. And from that we compute the flow that would have come into the Mendota Pool.

The Court: And then take that 12 per cent from that?

The Witness: Then we take the 12 per cent of the amount that is that is over 1360.

The Court: Over 1360 second-feet?

The Witness: Yes. [23,161]

* * * * *

Mr. Rowe: That you consider as taking out of the San Joaquin River.—

In other words, in your calculations in the old days they took out—now you have bought the water

(Testimony of Edwin F. Sullivan.)

rights, they no longer take out—but in making your calculations of the 12 per cent of the 1360 second-feet you assume they are still taking water out of the San Joaquin River.

The Court: What you want him to do is to get the take-outs that he assumes——

Mr. Rowe: Yes.

The Court: ——and to check them and to be able to testify what is meant by the adjusted flow by Kerckhoff and Big Creek No. 7?

Mr. Rowe: Yes. [23,170]

* * * * *

The Court: By the way, before we get on to this subject, Mr. Rowe presented an affidavit, or rather an order yesterday, shortening time on his motion to strike the answer of the [23,179] defendant officials. I shortened the time and set it for hearing for next Tuesday.

I told Mr. Rowe when I signed the order, and I wish to state now, that my present disposition—I will, however, hear whatever arguments he has to make, but my present disposition—is not to strike the answers of the defendant officials.

The defendant officials here apparently have no control over their counsel, the Attorney General. They came into this lawsuit and were brought into it and were represented for a period of five or six years by the statutory representative, the United States Attorney or Special Assistant to the Attorney General, and while it is true that the statutory period for their answers has long since expired,

(Testimony of Edwin F. Sullivan.)

I see no reason why these defendant officials should be penalized either for the ignorance of the Attorney General in not filing the answers within the time or for the arrogant attitude of some underling in the Attorney General's office to refuse to file them.

I cannot believe that the Attorney General of the United States, Mr. Brownell, or that the Secretary of the Interior of the United States, Mr. Douglas McKay, are aware of the fact that these answers were not filed in time or are aware of the fact that the United States has filed no pleading in this case and is not represented. [23,180]

* * * * *

Mr. Goldberg: Your Honor, I would like to make the suggestion that Mr. Sullivan's memorandum from which he is testifying be marked as an exhibit for identification at this time.

The Court: If you have copies, Mr. Sullivan, it would help in following the testimony.

Mr. Goldberg: I think it would help all of us.

The Court: Do you have copies?

The Witness: I have three.

Mr. Rowe: Would you please, Mr. Goldberg, not use that word "suggestion" in your speeches any more. It throws me.

The Court: This will be marked for identification No.—Mr. Clerk, what?

Mr. Goldberg: I think it is 409, your Honor.

The Clerk: Yes, Exhibit 409.

(Testimony of Edwin F. Sullivan.)

(The document referred to was marked Plaintiffs' Exhibit No. 409 for identification.)

The Court: Very well. Mr. Rowe, Mr. Goldberg and myself each have a copy now of Exhibit 409. Will you proceed.

Mr. Rowe: I think that very clearly explains the matter.

The Court: Let us have the witness explain it.

Q. (By Mr. Rowe): All right. Will you explain it?

A. The first six lines in this exhibit illustrate the [23,181] method for computing the inflow into Friant Reservoir and it is based upon the simple algebraic equation that the inflow into the reservoir must equal the outflow, plus the change in storage, and all you have to do is to insert the proper numbers into that equation.

The numbers, the first five lines——

The Court: The first number on March 5, 1954, the change in storage at Friant was 1008 second-feet more than the day before, is that it?

The Witness: That is right. The storage increased by that amount.

The Court: And on March 6 it increased 655 feet over March 5th?

The Witness: That is correct.

The Court: And the evaporation from Millerton Lake, there was 11 feet evaporated, that is, 11 second-feet, evaporated?

The Witness: That is correct.

The Court: On March 5th?

(Testimony of Edwin F. Sullivan.)

The Witness: Yes.

The Court: Now there is no plus or minus sign before the 12 on March 6.

The Witness: That should be a plus there.

The Court: That is a plus sign?

The Witness: Yes. [23,182]

The Court: In other words, that means that that much water did evaporate?

The Witness: That is correct.

The Court: And the San Joaquin River release, that 106 on March 5th and 106 on March 6, 1954, that is the amount assumed to be released on that date down the river?

The Witness: Yes, it is the amount that was released according to our measurements. It is a measured amount.

The Court: These are actual figures?

The Witness: These are actual figures on these particular dates.

The Court: I see. I thought they were hypothetical figures.

So on March 6th, 106 second-feet was released in the valves down the river, is that right?

The Witness: That is correct.

The Court: And 106 on March 6th?

The Witness: Yes.

The Court: There was no water released on the Madera Canal on either day, and there was 360 second-feet released on March 5th to Friant-Kern and 426 on March 6th?

The Witness: That is right.

(Testimony of Edwin F. Sullivan.)

The Court: Now your total of 1485 is the sum of all those figures?

The Witness: Yes. [23,183]

The Court: By the way, that San Joaquin release plus 106, that means there was 160 more released on March 5 than on March 4th?

The Witness: No, that is the actual amount that was released. It is a flow in the river just below the dam.

Mr. Goldberg: Does that same apply to the change in storage, Mr. Sullivan, in the first line, that plus 1008, that is a measured change in storage?

The Witness: That is a measured increase in storage, yes.

The Court: Over the previous day?

The Witness: Over the previous day.

The Court: But this release down the San Joaquin, that is not 106 feet more than the previous day?

The Witness: No, it is the actual flow on that day.

The Court: Then the next line is change in storage at Dam No. 7. There was no change from the day before on March 5th?

The Witness: That is right.

The Court: On March 6th there was 19 second-feet less than on March 5th?

The Witness: That is right.

The Court: And the change in storage at Kerckhoff, there was 56 second-feet less on March 5th

(Testimony of Edwin F. Sullivan.)

than on March 4th, and 42 second-feet less on March 6th than on March 5th? [23,184]

The Witness: That is right.

The Court: Now you subtract those from your computed Friant inflow?

The Witness: That is right.

The Court: And total your figure, adjusted river at Friant?

The Witness: That is correct.

The Court: Now I do not understand why you have your change in storage at Dam No. 7.

The Witness: The objective here is to reconstruct conditions as they existed prior to the construction of these various facilities.

Mr. Goldberg: You mean prior to the construction of Friant Dam, Dam No. 7 and Kerckhoff?

The Witness: Yes. Because what we compute to be available at Mendota Pool, as I understand it, is supposed to not consider them as being available or to consider conditions prior to their construction.

The Dam No. 7 was constructed in relatively recent times—I don't remember the exact date, but it was in the 1940s—and the Kerckhoff Reservoir was constructed at a much earlier date, but it was intended to be operated on the river as it flowed past without providing any storage whatsoever. In recent years they have started to provide storage, and this is a change in a condition which we are trying to reconstruct. [23,185]

The Court: I see. What you endeavor to arrive

(Testimony of Edwin F. Sullivan.)

at here is what the flow at Friant would have been on the date of this decree, or whatever it was?

The Witness: I think that would be right. At least in the absence of these particular dams.

The Court: Prior to the Miller & Lux contract?

The Witness: I believe that would be correct.

The Court: Very well. Now your next step?

Mr. Rowe: May I interrupt just to point out, I rather think, and my evidence will probably show, that no prescriptive rights have attached to Dam No. 7 nor Kerckhoff as yet. The other dams have been in operation for over five years and under the authorities have prescriptive rights, possibly not against Tranquillity, so that they are assumed just operating as part of the river.

But these two dams not having prescriptive rights still have to be adjusted. That is just my guess as to why this rule originated, and that will be my theory.

The Court: Whatever it is, the witness has explained what he does.

Q. (By Mr. Rowe): Mr. Sullivan, before we leave Plaintiffs' Exhibit 409 for identification, there is no adjustment made for the daily storage beyond the inflow, say, into Bass Lake or [23,186] additional discharge from Bass Lake more than the inflow to Bass Lake, is there, in these calculations?

Mr. Goldberg: I don't understand the question.

Mr. Rowe: I think the witness does.

The Court: Let me hear the question.

(Testimony of Edwin F. Sullivan.)

(The question referred to was read by the reporter as follows:

("Q. Mr. Sullivan, before we leave Plaintiffs' Exhibit 409 for identification, there is no adjustment for the daily storage beyond the inflow, say, into Bass Lake or additional discharge from Bass Lake more than the inflow to Bass Lake, is there, in these calculations?")

The Court: Bass Lake is the name of the lake back of what dam?

Q. (By Mr. Rowe): Green Valley Reservoir, is it not, Mr. Sullivan?

A. Well, the term Bass Lake and Green Valley Reservoir are interchangeable.

The Court: Do you understand his question or do you want to hear it again?

The Witness: I believe I understand it. If I might state it this way: The computations do not try to restore the conditions to what they would have been prior to the operation of Bass Lake. I don't know whether that answers it or not. [23,187]

The Court: I think that answers the question.

Q. (By Mr. Rowe): Mr. Sullivan, I am not trying to trap you or anything, I think your method of eliminating the storage or release from storage at these other dams frankly, with the possible exception of Tranquillity, is correct, but all I am trying to bring out from you, there is no adjustment for storage or increased storage at any other dam except Dam 7 and Kerckhoff in these

(Testimony of Edwin F. Sullivan.)

calculations on the particular day that you make your calculation, is there?

A. I think that is evident from what we have done here.

Q. Is the answer yes? I mean, you make no adjustment for increased storage—I am going to break this into two questions—in Plaintiffs' Exhibit 409 there is no adjustment of the final figure for any increase storage in any power company reservoir outside of Dam 7 and Kerckhoff?

Mr. Goldberg: I will object to that. It has been asked and answered a couple of times.

Mr. Rowe: No, it hasn't.

The Court: I think the question is good.

Mr. Rowe: Would you read that again, Mr. Reporter?

(The question referred to was read by the reporter as follows:

("Q. I mean, you make no adjustment for [23,188] increased storage—I am going to break this into two questions—in Plaintiffs' Exhibit 409 there is no adjustment of the final figure for any increase storage in any power company reservoir outside of Dam 7 and Kerckhoff?")

The Witness: No, the computations do not include such an adjustment.

Q. (By Mr. Rowe): Neither is there any adjustment reflected in your final figure on Plaintiffs' 409 for any additional releases from any power company dam with the exception of Dam 7 and

(Testimony of Edwin F. Sullivan.)

Kerckhoff above the inflow back of those power company dams for any particular day, is there?

The Court: Now I don't understand that one. You said releases from the dams and then you said back of the dam.

Mr. Rowe: I will withdraw that question.

Q. And Plaintiffs' Exhibit 409, with the exception of Dam 7 and Kerckhoff, there is no adjustment for additional water released from any power company reservoir over and above the intake on that particular day to that power company reservoir, isn't that true, with the exception of Dam 7 and Kerckhoff?

Mr. Goldberg: I object, your Honor. This has been asked and answered. He states he makes no adjustment for operations other than Kerckhoff and Dam 7. [23,189]

The Court: Do you understand the question, Mr. Sullivan?

The Witness: I believe so.

The Court: You may answer it. The objection is overruled.

The Witness: The computations include no adjustments for operation of reservoirs other than Dam 7 and Kerckhoff as shown on the exhibit.

The Court: Except releases from them because water is released from them to get into Friant?

The Witness: The water that is released from them is automatically reflected in the numbers as they occur.

The Court: Yes. But what he is getting at is,

(Testimony of Edwin F. Sullivan.)

you do not take into calculation the comparative change in storage at any of these other reservoirs from day to day.

The Witness: That is correct. [23,190]

* * * * *

Mr. Rowe: May I ask that Exhibit 409 be admitted in evidence?

The Court: It is admitted.

(The document referred to was marked Plaintiffs' Exhibit No. 409 and received in evidence.)

* * * * *

The Court: Now 409-A is marked for identification. It is called "Example of Method Used to Compute Inflow into Mendota Pool."

And, incidentally, Mr. Goldberg, in response to your request of yesterday, Exhibit 409 is entitled "Example of Method Used to Compute Adjusted Flow of San Joaquin River at Friant, All Values in Cubic Feet Per Second."

Mr. Goldberg: Thank you, your Honor. I knew I would forget it. [23,191]

* * * * *

The Witness: This Exhibit 409-A indicates the deductions that were made from the adjusted river at Friant in order to determine the computed inflow into Mendota Pool.

The Court: So the first column is the date?

* * * * *

The Court: So that there was 4003 inflow to Mendota Pool in excess of 1360, 12 per cent would

(Testimony of Edwin F. Sullivan.)

have been 140, the date would have been the 11th, Tranquillity would be entitled to——

The Witness: I need to correct that. The 12 per cent is not 140. The 12 per cent would be somewhat larger than 140, but in our computations we limited the amount to 140, which is the same number that was used in the previous study on evaluating the water rights of the Tranquillity Irrigation District when we were considering the negotiation of an exchange agreement. I believe there is an exhibit in the record, or rather the exhibit is that report.

The Court: So that where that single caret appears on those two 140s, that is not an actual 12 per cent of the excess? [23,196]

* * * * *

The Witness: The reason for including that is that I [23,197] understand there is some agreement someplace, and I do not know the document which states that whenever the Edison Company stores water in its reservoirs, when the flow at certain gauging stations is less than an amount under which they are permitted to store, then Tranquillity perhaps would be able to receive 100 second-feet.

Maybe I had better back up and explain the Edison Company contract on that first. I realize it is complex.

Mr. Rowe: The contract is in evidence.

The Court: The Edison Company?

(Testimony of Edwin F. Sullivan.)

Mr. Rowe: Yes, the contract between the Edison Company and Tranquillity.

Mr. Goldberg: Do you have the number, Mr. Rowe?

Mr. Rowe: It is toward the end of the plaintiffs' exhibits.

The Court: Exhibit 271.

* * * * *

The Witness: To start out for an explanation of this, the Edison Company is permitted to store in its reservoirs only under certain conditions, and one of the conditions is that unless the flow at Kerckhoff is equal to or greater than [23,198] a certain amount they may not store water in their upstream reservoirs.

The Court: I see.

The Witness: Sometimes, however, they will, and when they do, as I understand this situation, and it is what I have been told, not what I have determined myself, when they do store at a time when the flow is less than when they normally would be permitted to store then Tranquillity would be entitled to this 100 second-feet.

The Court: Regardless of the amount they store?

The Witness: That is my understanding of it.

The Court: Is that your understanding of the contract, Mr. Rowe?

Mr. Rowe: I think it is, your Honor. [23,199]

* * * * *

Q. (By Mr. Rowe): Now, in 1954 in determining the 12 per cent over 1360 second-feet, you

(Testimony of Edwin F. Sullivan.)

made no deduction for any theoretical Kings River flow in the Fresno Slough, did you?

A. That is true.

* * * * *

Cross Examination

Q. (By Mr. Goldberg): Mr. Sullivan, if I understood your testimony yesterday correctly, it is possible to serve the Tranquillity Irrigation District, the James Irrigation District and the Traction Ranch with water from sources other than the San Joaquin River. [23,206]

A. Yes, that is correct.

Q. To put it more specifically, it is possible to serve them with water through the operation of Shasta Dam, the Tracy Pump and the Delta Mendota Canal.

A. Yes, that water can be delivered into the Mendota Pool and then physically be re-diverted by the other districts, those districts you mentioned.

The Court: Where is the point of diversion of Tranquillity from the Mendota Pool?

A. Well, it is from Fresno Slough, but it is in the back water of Mendota Pool. [23,207]

* * * * *

Q. (By Mr. Goldberg): Do you know how much Tranquillity takes from the Kings River?

A. No, I don't know off-hand. [23,209]

* * * * *

ROBERT C. ARNOLD

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Will you state your full name, please.

The Witness: Robert C. Arnold.

The Clerk: Take that seat, please.

Direct Examination

Q. (By Mr. Rowe): Mr. Arnold, you have testified in this lawsuit before, have you not? If you were asked the same questions that you were asked at the previous times you have testified in this lawsuit, would you give the same answers?

A. Yes.

Mr. Rowe: No questions, your Honor.

The Court: Cross examine?

Mr. Goldberg: No questions, your Honor.

* * * * *

JESSE FRANK MARTIN

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name.

The Witness: Jesse Frank Martin.

The Clerk: Have that seat, please.

Mr. Rowe: Oh, I forgot to ask Mr. Arnold, if there has been any change in the title to his property since the man from the Security Title Company testified in this case.

Mr. Arnold: No.

The Court: Very well.

Direct Examination

Q. (By Mr. Rowe): Mr. Martin, you have appeared as a sworn witness in this action before?

A. Yes.

Q. And if the same questions were asked you that were asked you in your previous appearances in this case as a witness, would you give the same answers?

A. Yes, I would give all the same answers, except with an enlargement of what I have watched since the proceeding, [23,214]

* * * * *

The Court: Has there been any change in the ownership of your property, the title? [23,215]

The Witness: I have added one thirty-acre piece. I have bought one thirty-acre piece since.

The Court: Where is that?

(Testimony of Jesse Frank Martin.)

The Witness: It adjoins the original property on the north.

The Court: You are now the owner of it?

The Witness: Yes.

* * * * *

Mr. Goldberg: How long have you owned the original holding, Mr. Martin.

The Witness: Since 1938. There has been additions probably yearly since 1938. [23,217]

* * * * *

CHARLES H. LEE

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: Give your full name, please.

The Witness: Charles H. Lee.

The Clerk: Take that seat, please. [23,222]

Direct Examination

Q. (By Mr. Rowe): Mr. Lee, you have heretofore testified in this action, have you not?

A. Yes.

Q. If the same questions were asked you as were asked on your previous testimony in this case, would you give the same answers today?

A. Yes, except in so far as there may be obvious typographical errors, and with respect also to the cost estimates as testified to by Mr. Peterson yesterday.

* * * * *

(Testimony of Charles H. Lee.)

The Court: If I understand your testimony correctly, your answers would be the same except as to the two specific items you mentioned, and except as the testimony would be [23,223] affected by the physical events which have happened since.

The Witness: Yes, sir.

The Court: And on those do you expect to have this witness elaborate?

Mr. Rowe: Well, no, I do not.

Q. Mr. Lee, would your answers be substantially the same to the questions heretofore asked you.

The Court: Well, now, do you want it substantially, or do you want to leave your question the way it was?

Mr. Rowe: Well, I would like to ask him, with the exception of the fact that the water table has lowered, and the increase in the cost of the check dams, would you give the same answers if asked the same questions you have heretofore been asked.

A. Yes.

Mr. Rowe: That is all.

Mr. Goldberg: No questions, your Honor.

The Court: Step down. [23,224]

* * * * *

DUANE M. FOLSOM

called as a witness by and on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Duane M. Folsom.

* * * * *

Direct Examination

Q. (By Mr. Rowe): Mr. Folsom, you have already been sworn in this case, have you not?

A. I beg your pardon?

Q. You have already been sworn and have given testimony prior to today in this case?

A. Yes, I have.

Q. Now how many irrigation wells do you have on your land?

A. You mean out of the ground?

Q. Out of the ground.

A. Right now I have two.

Q. Did any of those go dry on your property listed in [23,226] this suit in the river bottom in 1954? A. Yes.

Q. What happened to the crops being supported by them?

The Court: How many wells went dry? Both of them?

The Witness: No, just one of them.

The Court: One went dry?

The Witness: Yes.

Q. (By Mr. Rowe): Did you lose any crops as a result of it?

(Testimony of Duane M. Folsom.)

A. We just gave up operating that acreage.

Q. How many acres?

A. Approximately 40 acres, somewhere between 30 and 40. I wouldn't know exactly.

Q. Let me ask you this: Since this action started, you have already testified, I believe, that you and your wife were divorced, Birdie Folsom?

A. That is right.

Q. Now as a result of that divorce did you acquire her interest in the property? A. Yes.

Q. And outside of that, have there been any other changes in ownership in the land?

A. None.

Q. And outside of the well going dry and this change in title, if I would ask you the same questions which I asked [23,227] you on your previous time on the stand, would you give me the same answers today? A. Yes, sir.

Mr. Rowe: That is all.

The Court: If all the questions were asked of you that were asked at your testimony previously would your answers be the same?

The Witness: Yes.

The Court: Except as you have indicated, the change in ownership and the dry well?

The Witness: Yes.

The Court: Very well. [23,228]

* * * * *

(Testimony of Duane M. Folsom.)

Cross Examination * * * * *

Q. (By Mr. Goldberg): Mr. Folsom, directing your attention to the well you say went dry in 1954, what efforts, if any, did you make to repair that well?

A. I didn't make any due to the fact that I figured that this thing was going to keep on going so I am going to pump all my water out of the river.

Mr. Goldberg: I have no further questions.

The Court: Did you have crops planted on the land?

The Witness: Yes, sir.

The Court: The 30 or 40 acres that you mentioned?

The Witness: I had it on half of it. In fact, I was using the other half as pasture, wild pasture and the other half was in permanent pasture.

The Court: Did you get any water on that 30 or 40 acres?

The Witness: No, sir.

The Court: That is not accessible from the river?

The Witness: No, sir.

Mr. Goldberg: I didn't hear the last question, your Honor.

The Court: It is not accessible from the water from the river. [23,229]

The Witness: No. In fact, I am leveling it right now so I can irrigate out of the river.

(Testimony of Duane M. Folsom.)

The Court: Very well. [23,230]

* * * * *

The Court: Let us call this No. 1, Folsom No. 1, and the other one Folsom No. 2 (marking on exhibit).

And this one is the one that went dry?

The Witness: That is right.

Mr. Rowe: And the court is referring to Exhibit A-9-A-1?

The Court: Yes, upon which I have drawn the symbol indicating the well. [23,233]

* * * * *

EVERETT G. RANK

called as a witness by and on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

The Clerk: Will you state your full name, please?

The Witness: Everett G. Rank. [23,234]

Direct Examination

* * * * *

Q. (By Mr. Rowe): In regard to wells that have gone dry this year, Mr. Rank, have you personally checked any wells in the river bottom outside of Mr. Folsom's that went dry in 1954 in the river bottom between Highway 41 and Friant Dam?

Mr. Goldberg: Excuse me just a moment, Mr. Rank.

By "personally checked" are we to infer that he personally has gone out and examined the well?

(Testimony of Everett G. Rank.)

Mr. Rowe: Yes.

Mr. Goldberg: All right.

The Witness: I have.

* * * * *

A. I was at Mrs. Simms' residence when they were drilling a new well there, and she didn't have enough water in her old well for domestic supply.

Q. When was that? What month approximately? [23,239]

A. Well, now, Mr. Rowe, I didn't put down any dates. It was during the summer months.

Q. Of 1954? A. Of '54. [23,240]

* * * * *

The Court: If all the questions were asked of you regardless of who asked them that were asked on the previous occasion, would your answers be the same?

The Witness: It would, yes, sir. [23,241]

* * * * *

DALE G. McCOON

called as a witness by and on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name.

The Witness: Dale G. McCoon.

* * * * *

Direct Examination

Q. (By Mr. Rowe): Mr. McCoon, if you were asked all of the questions that you have heretofore

(Testimony of Dale G. McCoon.)

been asked at this trial while on the stand would you give the same answers?

A. I would.

Mr. Rowe: That is all.

Cross Examination

Q. (By Mr. Goldberg): You have previously testified in this case, Mr. McCoon?

A. Yes, sir, I have.

Q. Are you a plaintiff in this case, Mr. McCoon?

A. Quite well, yes, sir.

Q. I say, are you a plaintiff?

A. Oh, yes, yes, sir.

Mr. Goldberg: I have no further questions, your Honor. [23,243]

* * * * *

GORDON GLOVER DUNN

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Gordon Glover Dunn.

The Clerk: Have that seat, Mr. Dunn.

Direct Examination

Q. (By Mr. Rowe): Will you state your full name here? A. Gordon Glover Dunn.

Q. And you are the Mayor and Commissioner of Public Safety and Welfare of the City of Fresno, are you not? A. That is correct.

(Testimony of Gordon Glover Dunn.)

Q. And you have been called to the witness stand before? A. No, sir.

The Court: I don't think he has testified in the case.

Mr. Rowe: Yes, he did.

The Witness: Yes, I did, that is correct, about two years ago.

Q. (By Mr. Rowe): That is right. Now, did you have a conference in Sacramento with the Division of Water Resources in regard to the application of the City of Fresno for water from the San Joaquin River? [23,259]

A. Yes, sir.

Q. And have you any letters that were sent you by the Division of Water Resources? The Court will remember that this letter, it was claimed by the State was never sent. That is the one I want. Have you copies of any letters?

A. I do.

Mr. Goldberg: Before we proceed with that, can you identify the time of the conference?

The Witness: September 15, 1953.

Mr. Goldberg: And who was present, Mayor?

The Witness: The then Governor Earl Warren, Frank Durkee, the Director of the Department of Public Works, and A. D. Edmonston, Chief of the Division of Water Resources of the State of California, and also James Snedeker, then Commissioner of Public Works of the City of Fresno.

Q. (By Mr. Rowe): Now, subsequent to the

(Testimony of Gordon Glover Dunn.)

meeting—I will get back to the meeting—did the Division of Water Resources send you a letter?

A. They have sent me a letter, yes.

The Court: What date was the meeting again?

Mr. Goldberg: September 15, 1953.

The Witness: That is correct, September 15, 1953.

The Court: Very well. [23,260]

Q. (By Mr. Rowe): At that meeting, was there any discussion between you and the State officials as to whether Fresno's applications were in good standing, and whether there was going to be a hearing on them? A. Yes, sir.

Q. What was said, and by whom?

A. By Mr. Edmonston, the State Engineer, did most of the talking. He produced letters from his files which showed that there had been correspondence between the then City Attorney of the City of Fresno and the Division in the late 1930s relative to the water rights of the City of Fresno, whereby it was mutually agreed that the rights would not be pressed at that time due to the need for construction of Friant Dam.

He stated to us, Mr. Snedeker and myself, that the rights were in good standing, that they would be heard within a few months, and probably in the month of February of 1954. He said the same promises had been made before, and I frankly don't think they intend to. [23,261]

* * * * *

(Testimony of Gordon Glover Dunn.)

The Court: Well, let's mark the whole series of correspondence here as one exhibit.

Mr. Goldberg: I think that would be convenient.

The Court: This will be No. 412?

The Clerk: 412.

The Court: Very well. Will you attach them together, and mark them as one exhibit, 412. Are they offered in evidence?

Mr. Rowe: They are offered in evidence.

The Court: They are admitted.

(The four letters referred to were marked as Plaintiffs' Exhibit No. 412, and were received in evidence.)

Mr. Goldberg: Before we go further, your Honor, may I read a description of them into the record?

The Court: Yes.

Mr. Rowe: I thought he was going to give me his statement as to whether the city's application was in good standing.

Mr. Goldberg: I would also like a chance to read those letters.

Mr. Rowe: All right.

The Court: Well, Exhibit 412 is a series of four letters. The letter of October 5, 1953, addressed to——

Mr. Goldberg: I will read this, if you wish, your Honor. There is the letter on the letterhead of the Department of Public Works, State of California, dated October 5, 1953. [23,263]

The Court: Addressed to?

Mr. Goldberg: Addressed to Mayor Gordon G.

(Testimony of Gordon Glover Dunn.)

Dunn, signed A. D. Edmonston, State Engineer, and it concerns applications 6771, 6772, 7134, 7135.

The next is a letter dated October 9, 1953, carbon copy of a letter, addressed to A. D. Edmonston, State Engineer, presumably signed by James Snedeker, Commissioner of Public Works, concerning the same four applications.

The Court: Well, it concerns enclosures referred to in the letter of October 5th, which were not enclosed.

Mr. Goldberg: Yes, your Honor.

The next is a copy of a letter dated January 3, 1952, addressed to the State of California, Department of Public Works, Division of Water Resources, and is signed by James Snedeker, Commissioner of Public Works, and it is a request to that Division that it immediately proceed to the hearing and granting of the four applications.

And the last is a copy of a letter, appearing on a copy letterhead of the State Department of Public Works, dated February 6, 1952, addressed to Mr. James Snedeker, and signed A. D. Edmonston, State Engineer, by Gordon Zander, Assistant Engineer, and concerning the same four applications.

The Court: Very well. They are in evidence.

Q. (By Mr. Rowe): Mayor, as I understand it, [23,264] you have made various requests to the Division of Water Resources to hold a hearing on the City of Fresno's application, have you not?

A. That is correct, sir.

(Testimony of Gordon Glover Dunn.)

Q. And they have made promises to hold hearings over a period of years, is that right?

A. That is correct.

Q. Have they ever kept those promises?

A. They never have kept those promises.

Q. In the meantime the waters of the San Joaquin River are being taken elsewhere, is that not so?

A. They are being diverted, as far as I am concerned, and probably the California water law is not being followed by the replenishment of that supply to this area which they are now taking away. That is Section 1446 of the California Water Code which says so.

Mr. Goldberg: I move the witness' answer be stricken.

The Court: Well, the latter part of the witness' answer may be stricken as expressing his conclusion and opinion.

Mr. Rowe: That is all, Mayor. [23,265]

* * * * *

Mr. Rowe: Mayor, we haven't had a conference on this subject. Since we are talking about desires, do you desire a ruling by this Court on whether the City of Fresno gets water, or one by Mr. Edmonston? Which would you desire?

Mr. Goldberg: Object to that, your Honor.

The Court: Overruled.

The Witness: I would desire this Court to do it. I think the State has had an ample opportunity in the past to demonstrate good will. [23,268]

* * * * *

(Testimony of Gordon Glover Dunn.)

The Court: And I think it is only due to the adament and absolutely unyielding position of the Attorney General's office that nothing has ever been accomplished and people are still litigating. I mean the United States Attorney General's office, because counsel for the districts indicated repeatedly their hope that some settlement could be made, and I think that counsel for the State, especially [23,278] before you came in, Mr. Arvin Shaw, I think that he had some ideas which might have resulted in a settlement, except for the unbending attitude of the Attorney General's office that they are going to have their way or nothing at all.

Mr. Goldberg: Your Honor, we all recollect——

The Court: The Bureau of Reclamation has——

Mr. Goldberg: May I say in fairness to the memory of Mr. Shaw that the idea of the plan of physical solution was initiated by Mr. Shaw with the objective of reaching some reasonable settlement.

The Court: That is right.

Mr. Goldberg: Now, further——

The Court: I would like to add more. The answer of the Bureau officials, the testimony of all of the Bureau officials who testified was to the effect that there was a recognized right to water in some or all of the plaintiffs here, but apparently the Attorney General's office of the United States, in spite of the repeated statements to Congress which I have had adherence to before, by the Bureau, and repeated statements in the pleadings in

(Testimony of Gordon Glover Dunn.)

this case, and the testimony of the witnesses, that they recognize water rights in the plaintiffs, all in this case. The Attorney General's office of the United States has nevertheless, as I say, been absolutely unbending and unyielding. [23,279]

* * * * *

Mr. Goldberg: * * * I will use the City of Fresno as an example—because it is a matter which is of greatest concern to the office of the Attorney General of the State of California. We would like to see a settlement for the City of Fresno negotiated.

* * * * *

Q. Mayor, going back to the Attorney General not knowing what we want, did you and I and Mr. Owens hold a meeting with Mr. Goldberg and Mr. Pat Brown in San Francisco?

A. On Good Friday.

Q. Good Friday.

The Court: 1954.

The Witness: 1954.

Mr. Goldberg: A working day, your Honor.

Q. (By Mr. Rowe): Were we rather definite and specific and voluble in stating what we wanted that day? A. Yes, sir.

Mr. Goldberg: Well, it is asked and answered.

Q. (By Mr. Rowe): And have you ever gotten anything except that letter [23,282] which came Friday, two days before the end of the trial of this case, I hope? Well, I mean, you made it clear——

(Testimony of Gordon Glover Dunn.)

The Court: Did you ever get anything other than the letter, which is Exhibit 413?

Mr. Rowe: Did you?

The Witness: No, sir.

* * * * *

Cross Examination—(Continued)

Q. (By Mr. Goldberg): Now, Mayor, you referred to a meeting with Mr. Brown, and Mr. Owens was there as I recall, and Mr. Rowe, you were there, I was there; I don't recall who else was there, if anyone, and you say that was on Good Friday of this year; is that right?

A. That is right. [23,283]

* * * * *

Q. * * * and I suggested to you that if you had a basis for a contractual price or had a contractual price set that would form the basis against which to ascertain damages. Do you recall that?

A. I do.

* * * * *

Mr. Goldberg: I don't remember your answer.

The Witness: That you can't drink damages.

The Court: Your answer was, you can't drink damages? [23,284]

The Witness: Yes, sir.

Mr. Goldberg: That is right.

* * * * *

Mr. Rowe: * * * There is one other thing we might get clear. Mr. Goldberg and I, in spite of the argument. I intend to ask Professor Smith the

(Testimony of Gordon Glover Dunn.)

same question I asked Mr. Lee, phrase it the same way: If the same questions were asked you today, all of the same questions that were asked you on your various appearances on the stand in the case of Rank v. Krug, would you give the same answers.

That is the only question I intend to ask him.

* * * * *

Mr. Goldberg: Your Honor, this is leading up, I hope, to a stipulation in open court. What it has to do with is Professor Smith's deposition. As has been said by one of our wits here, I don't want to go to Tucson, Arizona unless I at least have time to walk down the main street, so I am trying to arrive at some arrangement with Mr. Rowe so that I won't have to go.

Now, if this is the only question that Mr. Rowe is going to put to Professor Smith, yes, I will stipulate the deposition can be taken in my absence, but I would like that added further that if Professor Smith alters his testimony—— [23,286]

* * * * *

Mr. Goldberg: * * * But I will now at this time offer all of the evidence heretofore given in behalf of the defendants, and each of them, and in behalf of the intervenor State of California as evidence in this proceeding.

The Court: Admitted.

Mr. Rowe: I am going to object, your Honor, because I made that offer to the Attorney General and he never answered me, or the United States.

Mr. Goldberg: He is not here.

(Testimony of Gordon Glover Dunn.)

The Court: He is not here.

Now do you desire to move to admit all of the evidence in the case heretofore taken now?

Mr. Rowe: Is that your motion, all or just your part?

Mr. Goldberg: No, I limited it to the defendants on the understanding that you were offering on behalf of the plaintiffs. But if you wish to offer all, I have no objection.

Mr. Rowe: Then I have none either.

Mr. Goldberg: Then offer it.

The Court: What are you going to do about it? Are you [23,288] going to offer all of the evidence adduced on behalf of the plaintiffs or not?

Mr. Rowe: I am.

The Court: Why not do it?

Mr. Rowe: I do.

The Court: What do you do?

Mr. Rowe: I offer all the evidence heretofore given on the part of the plaintiffs in this case, preliminary injunction, main trial, pretrial conferences——

The Court: Everything?

Mr. Rowe: Yes.

The Court: You now offer it in evidence?

Mr. Rowe: And the complainants in intervention, City of Fresno.

The Court: As against the United States and as against all parties on the supplemental complaints?

Mr. Rowe: Yes.

(Testimony of Gordon Glover Dunn.)

The Court: And of the supplemental complaints and amendments and supplemental complaints?

Mr. Rowe: Yes.

The Court: Admitted.

Recess until 10:00 o'clock tomorrow morning.

(Whereupon, at 4:05 o'clock p.m., an adjournment was taken until 10:00 o'clock *p.m.*, Thursday, December 16, 1954.) [23,289]

* * * * *

Mr. Rowe: Call Mr. Gronlund.

CARL J. GRONLUND

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Carl J. Gronlund, G-r-o-n-l-u-n-d.

The Court: G-r-o-n——

The Witness: l-u-n-d; Carl.

Direct Examination

Q. (By Mr. Rowe): Mr. Gronlund, you are a registered civil engineer, are you not?

A. Yes, sir.

Q. And you are the manager of the Fresno Irrigation District? A. Yes, sir. [23,311]

* * * * *

A. Our average annual diversions of water into the District from the Kings River is 393,000 acre-feet. That is over a 34-year period. And from our

(Testimony of Carl J. Gronlund.)

studies they show that to maintain the underground water level where it is now we need 485,000 acre-feet annually.

* * * * *

A. The underground water level in the metropolitan Fresno is about 30 feet lower than it is in the surrounding area, indicating to me of course that the pumping is what is doing it. They are pumping about 50,000 acre-feet a year from wells for domestic use, I believe, and the metropolitan [23,316] area is pumping another 50,000, or 100,000 acre-feet of water being pumped out of the metropolitan area.

The Court: I did not understand your answer. You say "they are pumping 50,000" and the metropolitan area another 50,000. Which is the first "they"?

The Witness: Well, the City of Fresno is the first "they" of 50,000 acre-feet. [23,317]

* * * * *

The Court: In other words, do you need 92,000 acre-feet a year to service the irrigation wells?

The Witness: That is right.

The Court: Without regard to the city of Fresno?

The Witness: That is right.

The Court: I see.

Q. (By Mr. Rowe): Now, Mr. Gronlund, in your opinion to overcome that where will this 92,000 acre-feet have to come from? Come from some other source other than what you have now?

A. Yes. There is no more water available in the

(Testimony of Carl J. Gronlund.)

Kings River, that is, our supply, the Fresno Irrigation District supply, so any additional water that we need for our use here must come from some outside source. It must be imported from some outside source.

Q. Say Friant, for example, would that water do? I mean, could that be used, that type of water?

Mr. Goldberg: You mean the physical quality [23,319] of water from Friant is proper for irrigation in the Fresno Irrigation District, Mr. Rowe?

Mr. Rowe: Yes.

The Witness: If we or the City of Fresno or anybody here could import 50,000 or 100,000 acre-feet from Friant Reservoir, we would save ourselves.

The Court: Do you have an opinion as to whether or not this continuing shortage will become critical as far as the farmers within the district are concerned?

Mr. Goldberg: If your Honor please, I must have a definition of "critical."

Mr. Rowe: I am going to buy Mr. Goldberg a dictionary.

The Court: Yes, I think so. The objection is overruled.

The Witness: Under present irrigation conditions in our area—our area is approximately 236,000 acres; it extends 40 miles east, 40 miles west, 10 miles north and 10 miles south of the city of Fresno—we do believe it is becoming serious, very serious. The water level is dropping at the rate of

(Testimony of Carl J. Gronlund.)

three feet a year at the present time. In the last eight years we have lost 24 feet in our ground water table, and it is going to continue to drop at this rate under present irrigation conditions unless we import some water.

The Court: If it continues to drop at that rate, will it be economically feasible to farm? [23,319]

The Witness: It is going to hurt some of the small farmers. They are going to have to go deeper for their water. The cost might be prohibitive.

The Court: On an acreage basis might it ultimately become prohibitive at all so that it would not be worth farming?

The Witness: It could, yes. It has happened before.

The Court: I mean assuming that a man is farming to make money and do not assume that he is farming to write off a loss for his income tax.

The Witness: Yes, it could become prohibitive to the point where he would have to stop farming and go into something else to make a living, in my opinion.

Q. (By Mr. Rowe): Now, Mr. Gronlund, in your opinion is Pine Flat Dam, after seeing it operate this year and from your studies, will that bring in any substantially additional surface supply to the Fresno Irrigation District?

Mr. Goldberg: I object to that as calling for a conclusion, your Honor.

The Court: Overruled.

The Witness: The Pine Flat Reservoir will not

(Testimony of Carl J. Gronlund.)

produce any more water for the Fresno Irrigation District. [23,320] * * * that may be we had better ring the city of Fresno with our own wells to conserve our water for our farmers, maybe we had better concrete line our ditches so there won't be any seepage underground to conserve water for our farmers. [23,323]

* * * * *

Q. Would it be beneficial to the farmers if 50,000 acre feet were brought in to supply the City of Fresno and they stopped pumping? Would that be beneficial to the farmers of the Fresno Irrigation District? A. Yes.

Q. And if a hundred thousand acre feet were brought in would it be more beneficial to the farmers? A. That is true. [23,325]

* * * * *

A. SEGEL

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: A. Segel. [23,335]

* * * * *

The Court: Well, I will change it to read "to some or all" and at the appropriate time I will make a decision as to whether it was some or all.

* * * * *

Direct Examination

Q. (By Mr. Rowe): Mr. Segel, you are the

(Testimony of A. Segel.)

Commissioner of Public Works of the City of Fresno now, are you not? A. Yes.

Q. You have testified heretofore in this trial, have you not? A. Yes.

Q. And with the exception of the difference in the elevation of the water tables in the city wells, and population changes, if you were asked the same questions, all of them, that were asked you before, would you give the same answers? [23,337]

A. Yes, I would give all the answers that are not affected by the lapse of time. [23,338]

* * * * *

The Court: I think Mr. Rowe did on 416. "Map of Greater Fresno and Adjoining Territory, Fresno, California, with Legend: Indicates approximate location of water wells which have been re-drilled and deepened during period 1951 to 1954 by driller Herbert Schwartz and others." And 417 is entitled "Map of Fresno and vicinity" with a legend appearing to explain, to indicate general location of new wells drilled or re-drilled during period 1951 to 1954 by driller Herbert Schwartz and others." Another legend, "Indicates small town or post office," and another legend, "Indicates school house." [23,344]

* * * * *

Q. (By Mr. Rowe): Now of the total of 137, which includes those deepened, as I understand you, only six were deepened; the other 131 are the new wells drilled to replace old wells.

A. That is right.

(Testimony of A. Segel.)

Q. Yes. And under where it says 1951, 16, that means the number drilled in the year 1951?

A. That is right.

Q. And where it says 1952, it says 18, that means the number drilled of new wells, or includes the six that were deepened, 18.

And in 1953 there were 33 new wells drilled, or possibly some of the six deepened came in there, and in 1954 there have been 65 new wells drilled to replace old ones? A. That is right.

Q. Yes, and these red dots on Plaintiffs' 416 indicates the location of those wells.

A. Yes. [23,347]

* * * * *

Cross Examination * * * * *

Q. (By Mr. Goldberg): Now, Mr. Segel, you are familiar with the applications which the City of Fresno has to appropriate water? [23,360]

* * * * *

The Court: You mean you want to call him under 43(b)?

Mr. Goldberg: I would like to call him as an adverse witness. [23,361]

* * * * *

Redirect Examination

Q. (By Mr. Rowe): Was there a Government census taken of the City of [23,362] Fresno in August or September of 1954? A. Yes.

(Testimony of A. Segel.)

Q. What was the official population count?

A. 107,907.

The Court: How did that compare with 1950?

The Witness: In 1950 the census, your Honor, was 91,669.

The Court: Was the census taken of the metropolitan area, I mean also this area around Fresno?

The Witness: I beg your pardon?

The Court: Was the census also taken in the metropolitan area?

The Witness: No, sir.

The Court: Just the City of Fresno?

The Witness: Yes, sir.

The Court: Very well.

Q. (By Mr. Rowe): And, Mr. Segel, it was requested on account of the gasoline tax, wasn't it, to determine our population to see how much the Federal gasoline tax would be? [23,363]

* * * * *

Q. (By Mr. Rowe): Mr. Segel, based on a 10-year period growth, what percentage increase would that be?

A. On the basis of a 10-year section of time that represents an increase of 46 per cent.

Mr. Rowe: That is all. [23,364]

* * * * *

J. A. ROSS

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: J. A. Ross.

Direct Examination

Q. (By Mr. Rowe): Mr. Ross, you have heretofore testified in this action, have you not?

A. I have.

Q. And if all of the questions were asked you——

The Court: When did he testify? I do not have him in my list.

Mr. Goldberg: He is not in the list, your Honor.

Mr. Rowe: He was offered for cross examination.

Mr. Goldberg: That doesn't mean he testified.

Q. (By Mr. Rowe): Mr. Ross, you testified in this action before, did you not?

A. I testified in 1951.

The Court: That was in connection with the preliminary injunction.

Q. (By Mr. Rowe): If you were asked the same questions on the hearing [23,365] on the preliminary injunction would you give the same answers today? A. I would. [23,366]

* * * * *

WILLIAM KENNETH FINK

called as a witness by and on behalf of the Plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: William Kenneth Fink, F-i-n-k.

The Clerk: Have that seat there. [23,377]

Direct Examination

Q. (By Mr. Rowe): Mr. Fink, you are a registered or licensed civil engineer, State of California.

A. Yes.

Q. And where did you go to school? And what degree do you have?

A. I attended Stanford University. I have my A.B. and C.E.

Q. And when did you get that?

A. I got my A.B. in 1933 and C.E. in 1935.

Q. And in 1935 did you make a study and write a thesis on the area between Firebaugh and Los Banos, in the Miller & Lux domain?

A. I made a study on transportation losses. In other words, the title of my thesis was "Conveyance losses in underlying canals in the area from south Dos Palos to Los Angeles."

Q. You were born in Crowe Landing, were you not? A. Yes.

Q. And you have more or less been familiar all your life with the west side grass lands in the Miller & Lux system? A. Yes.

Q. And—these are leading—for a year and a

(Testimony of William Kenneth Fink.)

half [23,378] were you water master for Miller & Lux, the canal company?

Mr. Goldberg: Which canal company?

A. Yes.

Q. (By Mr. Rowe): You tell him.

A. I was employed by the San Joaquin Canal Company, which was one of the irrigation districts of the old Miller and Lux empire, from December of 1944 to April of 1946.

Q. And you are familiar with the distribution of water from all of their canals? A. Yes.

Q. And after you resigned from Miller & Lux, what position did you take?

A. I was then employed as engineer for the Grasslands Water Association.

Q. Now that has been incorporated into a water storage district, has it not?

A. No, that has now been organized into Grasslands Water District.

Q. Water District. That is right. And you buy water from the United States Bureau of Reclamation? A. That is right.

Q. And the original Grasslands distribution organization, was that a mutual water company formed in about 1944? A. Right. [23,379]

Q. Now, that area originally included an acreage of approximately 104,600 acres? That is the exterior boundary, they didn't all belong, but is that not true?

A. My recollection is a little over 100,000 acres.

(Testimony of William Kenneth Fink.)

Q. That was on the west side of the San Joaquin River, between Dos Palos and Newman?

A. That is correct, right between the San Joaquin River and the irrigated area of the old San Joaquin canal company.

Q. Was that area what you would call the controlled irrigated grass land area, or uncontrolled?

A. Well, there were some of both in the area.

Q. As of today, how big is the Grass Lands Water District?

A. We have approximately 42,000 acres.

Q. And what is that, controlled or uncontrolled?

A. That is all entirely controlled.

Q. Now what do you mean by controlled?

A. Controlled flooding in my estimation, is the flooding of land, is controlled by a system of levees either surrounding a parcel of land, or some ditches or through conduits.

Q. And how was it fed in the controlled grass lands area, from ditches?

A. From ditches and canals. [23,380]

Q. What are the outlets from those canals into the levees?

A. Oh, there was various types, wooden structures, pipes, weirs, open cuts, anything to let the water out.

Q. And did you say in the controlled grass lands approximately how many outlets, say, per section would you find either by headgates, concrete pipe, or other types of outlet.

(Testimony of William Kenneth Fink.)

A. Well, I am afraid that is too general a statement.

Q. All right.

A. We have one outlet for each parcel within our district; some of them have two or more.

Q. Was that the condition during the time Miller & Lux operated? I mean does your District use the same ditches and most of the outlets that Miller & Lux used to use for their land, or their subsidiary canal company? A. Yes.

Q. In other words, as I understand you, the controlled grass lands flooding was done by means of ditches, or sloughs, with openings by headgates, concrete pipe or other type of headgate, into leveed areas.

Mr. Goldberg: Now, if your Honor please, at first I thought Mr. Rowe was going to qualify this gentleman as an expert. Now he seems to be going on to question him in regard to the grass lands area. It is definitely out of this case. I would like some showing of the relevancy of this [23,381] testimony before we proceed with further questioning.

Mr. Rowe: Yesterday I introduced Report No. 3 in evidence of Mr. Sullivan. I am simply trying to explain the term "controlled grass land irrigation" in that document, the one that is commonly used in the grass land area by engineers, what is meant by controlled irrigation as distinguished from uncontrolled grass land irrigation. The distinction is also made in the Gerlach Cattle Company case, and I

(Testimony of William Kenneth Fink.)

think it would be of value if a certain young gentleman attempts to give his own definition.

Mr. Goldberg: Your Honor, with respect to Report No. 3, I forget the exhibit number, I think it is 413——

The Court: No, 413 is your letter.

Mr. Rowe: Oh, another thing, these questions are preliminary.

The Court: 414 is the Fresno Irrigation District.

Mr. Goldberg: 410, Report No. 3 is 410. On page 2 of Report No. 3, they give a definition of uncontrolled flow, and I take it that definition applies all through the Report.

Mr. Rowe: That is something entirely different from controlled grass land rights that is referred to, and I think if I am allowed to develop the whole case, I think I will show the materiality of it.

The Court: Well, I think the testimony is proper and appropriate to give understanding to the term which is [23,382] commonly used in connection with irrigation, with water in this area, and the objection is overruled.

Q. (By Mr. Rowe): In other words, Mr. Fink, controlled grass lands irrigation is generally the irrigation of an area of those lands known as the grass lands by a contour levee or ditch bank or some other—that will completely surround and confine it.

Q. Now, uncontrolled irrigation, could you give an example to the Court? The Court has gone between Fresno and San Francisco. Could you give an

(Testimony of William Kenneth Fink.)

example of the uncontrolled irrigation of the grass lands in the area, say, east of Los Banos?

A. Well, my typical example of that would be what I would consider the flood plain of the San Joaquin River. At times of high flow it merely floods out there.

Q. Well, take, for example, the highway between United States Highway 99 and Los Banos, where it crosses the San Joaquin River. Do you ever find an example of uncontrolled grass land irrigation in that area, and if so, where?

A. Well, it was, I believe it was in 1952 when we had such a high river that that country was flooded very extensively over there.

Q. Well, say, take east of the actual river channel and north of the highway, between U.S. 99 and Los Banos, the state highway. Do you know what number that highway is? A. That is 152.

Q. 152. How extensive would that uncontrolled flooding of the grass lands be? In other words, how wide and how long, along the east side of the San Joaquin River?

A. Oh, that varies considerably. Possibly you can get out there half or three-quarters of a mile in places.

Q. From the river on the east side? [23,384]

A. Bed of the river.

Q. And how long would it run along the east side of the San Joaquin River, how many miles?

A. Oh, possibly 40, 50 miles.

Q. And would I be wrong if I said it looked like

(Testimony of William Kenneth Fink.)

a lake or an ocean as you drove from 99 to Los Banos in times of high water of the San Joaquin River? A. No.

Q. I would be correct? A. Yes.

Q. Could you see the northern and the southern boundaries of that flooded land? A. No.

Q. In the state highway, are there various bridges to let those uncontrolled waters flow?

A. Yes.

Q. Now, does that same condition exist in some of the sloughs that feed from the San Joaquin River down to Mendota, I mean where they overflow when there is high water in the river?

A. Well, the sloughs all are more or less part of the river. At high water they are completely obliterated.

Q. In other words, from slough to slough is a large body of water?

A. They branch off from the river. [23,385]

Q. And your definition of controlled grass land irrigation, is that the definition accepted by engineers and the people who run water on the west side? A. Yes.

Q. Now, turning to the grass lands, have you records of the actual use of water from—the records of the Grass Lands Water Association, Grass Lands Water District, are under your control, are they not?

Mr. Goldberg: Just a minute. Your Honor, I am going to object to further questioning. Mr. Rowe stated his purpose was to have the witness define con-

(Testimony of William Kenneth Fink.)

trolled and uncontrolled flow as used in Report No. 3, and he has now defined controlled flow and uncontrolled flow, and I don't see that the records of the——

The Court: What is the purpose?

Mr. Rowe: The purpose of this, your Honor, is to give credence, I would say, to Mr. Sullivan, and I think Mr. Lee is going to back Mr. Sullivan's testimony up, but I have to establish roughly—I think it would be helpful to the Court—the amount of use which you get in the controlled grass lands irrigation, actual use where they have had records. I think it is very important. It is a preliminary question, but if it isn't material I certainly move to strike it.

Mr. Goldberg: It is going into an area beyond the boundaries of this. [23,386]

The Court: Motion to strike what?

Mr. Rowe: I mean, if my questions and answers are not pertinent. In other words, on Tranquillity Irrigation District I think it is very material. It is not absolutely necessary, but it is material evidence in the case of Tranquillity Irrigation District. I am going to put on some evidence on prescriptive rights and their use, to show what the beneficial use, the actual beneficial use in the grass lands water area was of water.

Mr. Goldberg: But the question does not relate to Tranquillity, but it relates to an area 20 miles below.

Mr. Rowe: Yes, but Tranquillity in schedule

(Testimony of William Kenneth Fink.)

number 3, the various rights are set up in there. Now I wanted to give some independent evidence as to the nature of Tranquillity's rights, as against some of these others.

Mr. Goldberg: Well, Tranquillity's rights, if they have any against diversion downstream is not an issue in this case.

Mr. Rowe: No, the Bureau claims they bought something. I want to show what they bought, what their rights on the river are as against Tranquillity and others.

The Court: You mean under the Miller & Lux contract?

Mr. Rowe: Yes. I think it is very material, and I think with two or three more questions it will appear so.

The Court: Isn't it pretty well defined in the contract? I mean the amount? [23,387]

Mr. Rowe: Well, you recall the words of Mr. Boyd, that we were held up, we did not have to do this but they were a big corporation so we were bound by blackmail. In my question that is what I want to show.

Mr. Goldberg: Whatever Mr. Boyd said was or whatever Mr. Boyd's ideas were, the Supreme Court ruled against him, and I assume we are going on the theory enunciated by Mr. Justice Jackson rather than Mr. Boyd.

Mr. Rowe: Your Honor, I think I——

The Court: Of course, Mr. Boyd said the United States is taking the water. I guess you weren't here

(Testimony of William Kenneth Fink.)

when he made his opening statement. He said it was a very brief one, the United States is taking the water period.

Mr. Goldberg: I am inclined to agree with Mr. Boyd in that case, that the United States has taken the water. Where Mr. Bold and I part company, I think, is where he said the United States did not have to pay for what it had taken.

Mr. Rowe: I assure the Court it is material.

The Court: You can assure me, but the only reason that you have mentioned so far of why it would be at all material would be to show the amount of water which the United States got, or which Miller & Lux gave up.

Mr. Rowe: That is right.

The Court: By the exchange contract.

Mr. Rowe: That is right. [23,388]

The Court: Now, I read those contracts through hurriedly at the time they came in evidence. I don't remember them now, and I don't know that they would mean much.

Mr. Rowe: Well, they do, your Honor.

Well, I will withdraw it, and put it this way, to show my purpose.

Q. Mr. Fink, how much in acre feet per acre in the controlled grass lands may be beneficially used, in your opinion for the purpose of growing natural pasture for cattle?

Mr. Goldberg: Object to that, your Honor, on the ground that it is irrelevant and immaterial, beyond

(Testimony of William Kenneth Fink.)

any of the issues in this case. The grass lands are not involved in this proceeding.

The Court: Overruled. He is now asking his expert opinion as to the need of water in certain types of controlled grass lands.

Q. (By Mr. Rowe): Yes, that is for the growing of natural pasture for cattle.

A. One acre foot per acre.

Q. One acre foot per acre. Now, in the controlled grass lands area, approximately, as formerly owned by Miller & Lux, approximately what percentage were they able to flood by means of these levees in the controlled grass lands area? [23,389]

The Court: I was speaking to the Clerk and I didn't hear the question. I am sorry.

(Question read.)

Mr. Goldberg: Object to that, your Honor.

The Court: Percentage of what?

Mr. Rowe: Of the land.

The Court: Percentage of acres or percentage of acre feet?

Mr. Rowe: No, percentage of acres of land could be actually covered with water in the controlled grass lands area with the method used by Miller & Lux.

Mr. Goldberg: I will object to that, your Honor again. This is not a question of his opinion but a question of fact on an area outside the area covered by this suit.

Mr. Rowe: It is not. It directly refers to Tran-

(Testimony of William Kenneth Fink.)

quillity and the other complainant in intervention, as I will show.

The Court: Well, I will overrule the objection, Mr. Goldberg, subject to a motion to strike. I would have to examine these contracts before I am able to say that it is material or is not material.

The Witness: The answer to that is approximately 50 per cent. [23,390]

* * * * *

WILLIAM E. GLOTZ

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: William E. Glotz, G-l-o-t-z.

The Clerk: Have that seat there.

Mr. Rowe: May I have Plaintiffs' Exhibit 225?

Direct Examination

Q. (By Mr. Rowe): Your name is William Glotz, is it not?

A. That is right.

Q. What is your relationship to Tranquillity Irrigation District?

A. Well, I am a director on the Tranquillity Irrigation District. [23,394]

* * * * *

The Court: The question was whether or not your pumping from the river onto the pink lands on Exhibit 279 was open and notorious.

(Testimony of William E. Glotz.)

The Witness: I don't understand that part of it, your Honor, but I do know we did pump water on that land as long as I remember.

The Court: Well, let's put it another way then. Was it done in the dead of night furtively? [23,396]

The Witness: No, your Honor, it has always been done.

The Court: It has always been done? You say they have always pumped water onto that land, and when you have done it you have done it openly so anybody could see it?

The Witness: Oh, yes, since when I was a small boy there.

The Court: And that has always been done?

The Witness: Yes. Houses were on it and people lived on the land.

Q. (By Mr. Rowe): Have the Bureau of Reclamation, since they took over the operation of the river at Mendota Pool, have the officials been out at the Tranquillity Irrigation District and seen that use?

A. Well, evidently. I wouldn't know whether they saw the use or not, but it has been there. Our canals run through it, and so forth; the outlets are all there, the concrete gates, and so forth. [23,397]

* * * * *

A. As long as I have been on the board, and before that. I remember as far back as 1928, as I actually plowed some of that land for some of these people, and there were canals there and outlets and

(Testimony of William E. Glotz.)

everything, and as far as the general public in that area, why, that was all in the irrigation district.

Q. And continuously since that time has water been pumped from Fresno Slough and the San Joaquin River onto the land? A. Oh, yes.

Q. Yes. [23,398]

* * * * *

Q. (By Mr. Rowe): And what per cent have you been taking since 1941 of the water above 1360 second feet?

A. I understand 12 per cent. [23,399]

* * * * *

MARJORIE SIMS

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Marjorie Sims. [23,404]

Direct Examination

Q. (By Mr. Rowe): Mrs. Sims, you are one of the named plaintiffs? A. Yes.

Q. And since you filed the original complaint as one of the plaintiffs in the above-entitled action has the ownership of your land changed?

A. No, it hasn't.

Q. And did you have a domestic well on your property? A. Yes, I did.

Q. What happened to it this year?

A. It went dry. [23,405]

* * * * *

J. A. ROSS

recalled as a witness, having been previously duly sworn, resumed the stand and testified as follows:

Direct Examination * * * * * [23,444]

The Court: 421-A is entitled "Cross sections of the San Joaquin River taken 7-30-1951, cross section of pump No. 11, cross section of pump No. 8."

421-B is cross section of the San Joaquin River at pump No. 13, taken July 30, 1951.

And 421-C is entitled "Cross section of the San Joaquin River at pump No. 8, taken December 6, 1954."

And this one, 421-C is a cross section at the same point as pump No. 8 in 421-A?

The Witness: Yes. [23,446]

* * * * *

Mr. Rowe: No. Like the other witnesses—I haven't brought this out, but they all asked to read their testimony, Mr. Sortor, Mr. Stanley, Mr. Peterson, they all took, say, from three days to a week to read it. Now, none of them would give that answer without reading their testimony, and neither would Professor Smith, and he is in the process of reading.

The Court: I see. All right. Next witness.

Mr. Rowe: Is that clear now, Mr. Goldberg?

Mr. Goldberg: Yes. [23,457]

* * * * *

EDWARD PEYSON GREGORY

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please. [23,460]

The Witness: Edward Peyson Gregory.

The Clerk: Have that seat there.

Direct Examination

Q. (By Mr. Rowe): Mr. Gregory, you have heretofore appeared as a witness in this action?

A. I did.

Q. Both the preliminary injunction and in the main trial? A. I did.

Q. You have given testimony and filed affidavits?

A. I did.

Q. Would you give the same testimony, if you were asked all of the questions heretofore asked you while on the stand, if those same questions were asked you now? A. Yes, I would. [23,461]

* * * * *

CHARLES H. LEE

recalled as a witness, having been previously duly sworn, was examined and testified further as follows: [23,464]

* * * * *

Direct Examination * * * * *

Mr. Rowe: Now Exhibit 426 is entitled, "Seepage Loss From San Joaquin River Between Friant and Whitehouse, Comparison of Estimates by Wit-

(Testimony of Charles H. Lee.)

nesses Lee, Hill and Barnes, Wet Runoff Year 1940-41."

Q. Would you explain that exhibit, Mr. Lee?

A. That is similar to the other two exhibits except that I chose a year in which the runoff was about 50 per cent above average, namely, the year 1940-41.

Q. And you have increased the figure in Mr. Hill's Exhibit A-12-A, Plate 3, by the same 94.2 cubic second-feet? A. Yes.

Q. And your testimony on that Exhibit A-12-A, Plate 3, and Plaintiffs' 425 and 426 would be the same as your criticism of Mr. Hill's Plate 3 of Exhibit A-12-A that you have heretofore given?

* * * * * [23,472]

Mr. Rowe: I am going to put in another exhibit.

(The document referred to was received in evidence and marked Plaintiffs' Exhibit No. 426.)

Mr. Rowe: This is an exhibit to show that the Pine Flat Dam will produce the large amount of 959 acre-feet per year into the Fresno Irrigation District.

I had a challenge with Mr. Nelson that I could prove——

The Court: This will be Exhibit 427.

(The document referred to was marked Plaintiffs' Exhibit No. 427 for identification.)

* * * * * [23,473]

The Witness: I have checked over the computations that have been made, your Honor, and I also

(Testimony of Charles H. Lee.)

have contacted the Army Engineers who made detailed computations and the findings which I have made correspond in general to those of the Army Engineers, namely, that the average annual excess over and above the past diversions which have been and could be [23,480] made by canals and which could be made available by the Pine Flat Reservoir by calculating the flow during the year is 28,000 acre-feet per year, instead of the 13,230 which I obtained by this computation in Exhibit 427.

The Fresno Irrigation District's share of that water would be 2039 acre-feet which, if spread over the 170,000 acres, would be .012 of an acre-foot per acre per year. [23,481]

* * * * *

Q. (By Mr. Rowe): And on the month to month basis in the last line, the average 29,300 acre feet, that is the average estimated yield from the riparian entitlement of Tranquillity Irrigation District to the waters of the San Joaquin River up to pump capacity of 140 second feet as shown by Table 4, Report 3, of the Water Project Authority of the State of California, dated August of 1936.

A. Yes. [23,491]

* * * * *

Mr. Goldberg: All right. Does it show the maximum yield obtainable with a pump of 140 second feet capacity?

The Witness: Yes.

Mr. Goldberg: It does not show the maximum

(Testimony of Charles H. Lee.)

yield actually obtained with a pump of 140 second feet capacity?

The Witness: No.

Mr. Rowe: That is my next exhibit.

Mr. Goldberg: And this data which you have taken from Report No. 3 you interpret to apply exclusively to Tranquillity Irrigation District?

* * * * *

The Witness: Yes, for the reason that the pump capacity at Tranquillity Irrigation District is 140 second feet, and has been for many years, and is now greater than 140 second feet. [23,493]

* * * * *

A. Yes. I arrived at 40,500 acre-feet as the annual demand of the district under the prevailing crop pattern which is distributed through the year, January zero, February 320 acre-feet, March 2960 acre-feet, April 3890 acre-feet, May 6520 acre-feet, June 6730 acre-feet, July 7780 acre-feet, August 8340 acre-feet, September 3160 acre-feet, October 560 acre-feet, November 200 acre-feet and December 40 acre-feet, total 40,500.

That is the demand curve which was used.

* * * * * [23,508]

Mr. Rowe: I say originally Mr. Arvin Shaw took the position that the State of California owns the water of the Central Valley Project, which applies to the Sacramento and San Joaquin Valleys, that the Government of the United States was merely a trustee for the benefit of the defendant Districts. In this latest paper filed by Mr. Veeder and Mr.

(Testimony of Charles H. Lee.)

Rankin they take the position that the United States owns the water.

The Court: Owns the fee title, I think they used the expression.

Mr. Rowe: Owns the fee title, and in the position taken by Mr. Arvin Shaw before, the right of reservation of the waters, once the Central Valley Project is paid off in accordance with the basic Reclamation Law of 1902, that the reservation and ownership reverts to the State of California.

Now the United States is taking the position, as the court has stated, that they have the proprietary interest in the waters.

The Court: Of course Mr. Boyd made that statement as the representative of the defendants and as the Special [23,596] Assistant to the Attorney General before the trial started on the preliminary injunction, that the United States has taken the water. I suppose at some appropriate time somebody will be good enough to point out to me just how and when the United States took it.

Mr. Green: As long as that question as to the ownership of the water has been presented, your Honor, I by my silence do not wish to indicate on behalf of the Chowchilla Water District that we concur in the new position of the defendant officials, that the United States owns the fee title to the water.

It has always been our contention that the water is held by the United States in trust under the laws of the State of California for the beneficiaries, being

(Testimony of Charles H. Lee.)

the landowners within the various districts within the Central Valley Project. [23,597]

* * * * *

The Court: I understand now that you stand upon the allegations in your complaint in intervention concerning the ownership and title of the water.

Mr. Goldberg: Yes.

The Court: And that by that you do not admit any contrary or different allegation which may be contained in any of the answers filed by the defendant officials?

Mr. Goldberg: No. [23,605]

* * * * *

The Court: * * * I am not sure what I will do. Certainly the answers are long, long past due, and would be entitled to be stricken. But, as I indicated, the defendant officials here, all of them, that have testified I think except Mr. Spencer, and his predecessor did, they are conscientious, public officials trying to do their job the way they see it and interpret the law and apply it to the facts as they find them.

While there may be differences which result in litigation, nevertheless certainly those men, in my opinion, should not be abandoned, their position should have been stated to the court by way of a proper answer within the appropriate time, and I am not disposed to strike their answer and leave them here utterly defenseless just because, as I stated the other day, of the ignorance or the arro-

(Testimony of Charles H. Lee.)

gance of some lawyer, whom they cannot choose, but who nevertheless says he is representing them. * * * * * [23,607]

The Court: Your position is that no rights could attach to the City of Fresno's applications until the determination was had?

Mr. Goldberg: Yes.

The Court: And your position is likewise that no rights can attach to any other filing until a determination is had?

Mr. Goldberg: Yes. I think the State law is very clear on that.

The Court: Whether it be the United States or any other?

Mr. Goldberg: Yes. [23,609]

* * * * *

A. SEGEL

recalled as a witness having been previously duly sworn, was examined and testified further as follows: [23,668]

* * * * *

Direct Examination * * * * *

Q. (By Mr. Rowe): Now your next exhibit, Mr. Segel.

The Court: That will be No. 445.

(The document referred to was marked Plaintiffs' Exhibit No. 445 for identification.)

The Court: This is one sheet of paper with two tables on it, the top one entitled, "Fresno City Pop-

(Testimony of A. Segel.)

ulation, U. S. Census," beginning with 1880 and ending with 1950, and the second one, "Estimated Future Population Based on 25 Per Cent Increase and 40 Per cent Increase Per Decade."

Mr. Rowe: Was Plaintiffs' Exhibit 444 introduced in evidence?

The Court: Exhibit 444 is admitted.

Q. (By Mr. Rowe): Mr. Segel, would you explain Plaintiffs' Exhibit 445?

A. The top set of figures shows the years beginning with 1880 and shows the official governmental Federal census for each of those decades, 1880 to and including 1950, with the figures as shown in that second column.

Q. And from 1880 to 1950, Plaintiffs' Exhibit 445 shows that the City of Fresno has had an average increase in population over each 10-year period of 46.5 per cent? A. That is right.

Q. Now you have also projected an estimate of what [23,675] Fresno's population would be based upon a 40 per cent increase in population to the future?

A. Yes, that is shown at the right near the bottom, that column headed "40 Per Cent Increase as Per Decade."

Then beginning with 1950 and ending with the year 2020, the figures in the last column shows the corresponding projected or estimated population under those conditions.

The Court: The lower two columns here that

(Testimony of A. Segel.)

contain the same figures as are contained in Exhibit 444 and 443 for the corresponding years?

The Witness: Yes.

Q. (By Mr. Rowe): Now, Mr. Segel, have you made a comparable exhibit to Plaintiffs' 445 showing the growth of the state of California as a whole and the growth of the County of Fresno as a whole?

A. Yes, I did.

The Court: That is No. 446.

(The document referred to was marked Plaintiffs' Exhibit No. 446 for identification.)

The Court: It has two tables, the upper one called "Fresno County Population, U. S. Census," 1880 to 1950, and the lower one "Estimated Future Population"—I take it that that is Fresno County?

The Witness: Yes, sir. [23,676]

The Court: Based on 25 per cent and 40 per cent increase per decade respectively.

Q. (By Mr. Rowe): Now this is a comparable comparison and a comparable estimate into the future similar to Plaintiffs' Exhibit 445 but it applies to Fresno County, does it not?

A. That is right.

Q. Now have you a compilation of the State of California as a whole?

The Court: Have you projected these figures on water demand for domestic purposes on the basis of 342 gallons per capita?

The Witness: For the County?

The Court: For Fresno County?

The Witness: No, sir.

(Testimony of A. Segel.)

Mr. Rowe: No, we have not.

Q. Have you a comparable figure for the State of California as a whole?

This shows the growth of Fresno is greater than the State of California as a whole slightly.

The Court: That will be No. 447.

(The document referred to was marked Plaintiffs' Exhibit No. 447 for identification.)

The Court: It is entitled, "U. S. Census of California," from 1890 to 1950, in one table, and the second one is [23,677] "Estimated Future Population Based on 25 Per Cent Increase and 40 Per Cent Increase Per Decade."

I take it that is for the whole state of California?

The Witness: Yes, sir.

The Court: Go ahead.

Q. (By Mr. Rowe): Now, Mr. Segel, will you explain that exhibit any further if you feel it is necessary.

A. It is similar to the others exactly except applying to the state.

Mr. Rowe: I ask that 446 and 447 be introduced in evidence.

The Court: 445 has not been admitted.

Mr. Rowe: If I may submit that also.

The Court: They are all three admitted.

(The documents referred to were received in evidence and marked Plaintiffs' Exhibits Nos. 445, 446 and 447 respectively.)

Q. (By Mr. Rowe): Now have you another exhibit, Mr. Segel? A. Yes.

(Testimony of A. Segel.)

Mr. Rowe: This exhibit shows, if the court please, the method of breaking down——

The Court: That will be marked 448.

(The document referred to was marked Plaintiffs' Exhibit No. 448 for identification.)

The Court: It is entitled "City of Fresno, Water Division, Tabulation of Water Consumption Inside and Outside City Limits," and it appears to run from 1930 to 1954.

Q. (By Mr. Rowe): Would you explain that exhibit, Mr. Segel?

A. The first column are the years involved. In the second column those long enlarged figures are the gallons pumped per year by the Fresno City Water System and consumed. The third column is the gallonage transposed into acre-feet to show that for the year 1953, which is the last year that we have full data on, the acre-feet pumped shown there is 42,525.

In the next column, the fourth column, the population inside the city limits.

Then the census figures are repeated for the years where there was a census taken and the year intervening were interpolated on a straight line basis.

Then the next column is the population inside the city of Fresno and including the population outside of the city of Fresno, which is serviced by the Fresno System.

And that is based on an increase of the inside population by approximately 16 per cent. We found from a study that that was the ratio of the popula-

(Testimony of A. Segel.)

tion inside to outside. You have to increase it by 16 per cent to get a total population served by the System. [23,679]

* * * * *

The Court: This will be 449.

(The document referred to was marked Plaintiffs' Exhibit No. 449 for identification.)

The Court: This is just a memorandum. I think you can get it from the transcript.

It is dated December 15, 1954.

It says, "Subject: Flat Rate Water Service in California Cities," and then it lists the following:

Madera,
Merced,
Hanford, [23,683]
Selma,
Bakersfield,
Tulare,
Visalia,
Sacramento,
Modesto,
Fresno.

Is that correct?

The Witness: That is correct. [23,684]

* * * * *

(The document referred to was marked Plaintiffs' Exhibit No. 450 for identification.)

The Court: It says, "Fresno City Water Division, Pumps Lowered 1950-1954."

Proceed.

Q. (By Mr. Rowe): Mr. Segel, this exhibit

(Testimony of A. Segel.)

shows the number of pumps lowered in the Fresno City Water Department by years 1950 to 1953 inclusive? A. Yes.

The Court: That is, the station, the location and the distance that bowls were lowered?

The Witness: Yes, sir.

The Court: What was the necessity for lowering them, a lowered water table?

The Witness: A lowered water table. The pumps were sucking air. [23,685]

* * * * *

Q. Would this be a fair statement, Mr. Segel, of the present situation, that as the area served by the city enlarges the area served by the Fresno Irrigation District is correspondingly decreased?

A. That is true.

Q. Now, you have mentioned restrictions on irrigation of family gardens and lawns beginning in 1952, and you say those restrictions were imposed because of the falling of pressure in your mains?

A. That is right.

Q. That is an indication, is it not, the mains are not large enough to meet the demands which are placed upon them? A. That is right.

Q. It doesn't indicate in any way that there isn't a sufficient water supply to meet that demand, simply that the existing facility is not large enough to meet the demand?

A. The existing facilities are not large enough to meet the demand and that could also include not

(Testimony of A. Segel.)

only the mains but our pumping system, or pumping plant.

Q. Yes. As a matter of fact, the city has plans to enlarge its pumping system, does it not?

A. Well, we have generally in the budget each year funds for additional pumping plants to be installed, yes.

Q. As a matter of fact, for next year you are planning to put in, I think, seven or eight new wells, is that right? [23,690]

A. No, I don't recall there is that many. I don't recall the budget item on that.

Q. You are planning to put in some new wells next year? A. Yes.

Q. Do you think that you will be able to put in enough wells to make it possible to irrigate every day without restriction?

A. Perhaps not for a year or so.

Q. But eventually you will be able to remove the restrictions? A. We hope to, yes. [23,691]

* * * * *

CHARLES H. LEE

the witness on the stand at the time of adjournment, resumed the stand and testified further as follows:

Cross Examination

Q. (By Mr. Goldberg): Mr. Lee, will you please refer to your Exhibit 439?

The Court: By the way, the record will show

(Testimony of Charles H. Lee.)

the same appearances and lack of them at each of the hearings that we have had as was indicated on the first day, except for the presence of Mr. Green on one day. [23,707]

* * * * *

Mr. Abel: If your Honor please,——

The Court: Will you identify yourself, for the record, please?

Mr. Abel: I am the attorney for the California Farm Bureau Federation.

The Court: And your name?

Mr. Abel: Edson Abel.

The Court: And your address?

Mr. Abel: 2223 Fulton Street, Berkeley, California.

I would like to request the privilege of filing on behalf of the California Farm Bureau Federation a brief, upon the submission of this case, a brief directed to the question of the title and control of the use of the water [23,740] involved in this case.

Mr. Rowe: I am very happy to have him.

The Court: I see no reason why you should not be granted that permission. It will be most welcome, and your motion is granted, and if there are any other counsel representing any other water users, whether they are public organizations or agencies, who desire to file a brief amicus curiae on that or any other phase of this subject their points will be welcome.

Mr. Rowe: Mr. Abel, as I understand it, it is your viewpoint the government of the United States

does not own the waters, the State of California owns them, and the government actually is only a trustee with the right of reversion to the State of California?

Mr. Abel: That generally is the position of the brief. [23,741]

* * * * *

J. M. WINTON

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

Direct Examination

Q. (By Mr. Rowe): Mr. Winton, were you present at Sacramento, California, on March 25, 1953, at the hearing of the House of Representatives, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, of which Congressman Claire Engle was the acting chairman and at which Mr. Irving Pfaffenberger, Senior Counsel for the California Division of Water Resources, made certain statements?

A. That hearing was in Washington, D. C., Mr. Rowe, and I was there.

Q. Washington, D. C. Pardon me.

A. Yes, sir. [23,755]

* * * * *

(The portion of the transcript referred to is, in words and figures, as follows, to wit:)

Statement of Irving Pfaffenberger, Senior Attorney of the Division of Water Resources, State of California

Mr. Pfaffenberger. My name is Irving H. Pfaffenberger, [23,764] Senior Attorney, Division of Water Resources, State of California, appearing on behalf of the State Engineer, who is Chief of that Division and who is also the Executive Officer of the Water Planning authority.

Mr. D'Ewart. We are glad to have you here, sir.

Mr. Pfaffenberger. This matter of a bill which would reauthorize the Central Valley Project to provide for fish and wildlife as one of the purposes was discussed in Sacramento last Thursday at a meeting at which representatives were present from the Division of Water Resources, the Water Project Authority, State Department of Fish and Game, United States Fish and Wildlife, and the Department of Public Works. We got together pretty well on the language of the bill, and that was sent to Congressman Hunter. Most of the representatives who were at that meeting in Sacramento last Thursday are here now, and in discussing the matter yesterday with Congressman Hunter it seemed advisable that we do further work on the bill, which was done, and the bill that Congressman Hunter referred to this morning, which he may introdnce as a substitute measure, I think is substantially the same as the draft we worked on in Sacramento and agreed on in Sacramento.

I would like to make a little statement as to our

position, the position of the State Engineer, Division of Water Resources, relative to some of the board principles involved [23,765] in H. R. 3794, and companion legislation, which is now before the committee, so with your Chairman's permission I would like to read into the record a rather short statement.

Mr. D'Ewart. Before you leave this new draft: does it have your approval? And the approval of the Engineering Office?

Mr. Pfaffenberger. I haven't conferred directly with the State Engineer. He is out of town. But speaking personally, I think it is a pretty good job. I think we have gotten together substantially on all of the principles that are involved.

However, I would like to reserve the right to consult with my superiors when I get back to Sacramento and there may be a possibility that some amendment may be suggested, but I think it is substantially as meets with our views.

It is our position, (1) priorities governing the use of water should be determined in accordance with state law, and the right to the use of all water may only be acquired pursuant to such laws, and such use is subject to state regulation and control.

The right to the use of water is acquired pursuant to appropriation in the manner provided by state law, quoting division 1 of the water code.

Mr. Aspinell. May I ask a question there, Mr. Chairman?

Mr. D'Ewart. Mr. Aspinell. [23,766]

Mr. Aspinell. In order to follow that document,

which I think is pretty well accepted in the West, you wouldn't go so far as to jeapordize any established Federal reclamation in its feasibility, would you?

Mr. Pfaffenberger. No; I don't think that the matter of state control over the use of water, particularly the consumptive use of water from a reclamation project, would have anything to do with the feasibility of the project.

Mr. Aspinell. If the water was set aside, already decreed over to a Federal reclamation project or for that matter any other project, you wouldn't then call up the document that you have just enunciated to take care of priorities until the project was assured of its continuing feasibility?

Mr. Pfaffenberger. I may cover this in a further statement here, Congressman.

Mr. Aspinell. All right.

Mr. Pfaffenberger. I could say that the Bureau of Reclamation is an applicant to appropriate water pursuant to state law. So far, it has not yet secured a permit. That determination as to the quantity of water that the project would be allocated under state law, and the conditions have not yet been arrived at.

Mr. Engle. I think Mr. Aspinell of Colorado misunderstood your statement to this extent: that the allocations to the Central Valley Project have been made under state law, [23,767] and by assignments of water rights by the state authorities, the statement of that principle is the one just made by the witness.

It is merely a verification and a restatement of the policy that we have always asserted with reference to the predominance of local authority in the disposition of water resources.

Mr. Pfaffenberger. Congressman, the state has definitely not assigned any water rights to any agency of the government in connection with the Central Valley Project. There are certain state filings made to preserve water rights in connection with the development of a coordinated program. Those assignments are assignments of applications to appropriate water.

Mr. Engle. That is right.

Mr. Pfaffenberger. And there has not been a final determination on those appropriations as yet.

Mr. D'Ewart. I would like to suggest you start again, and I would like to say for the benefit of the new members, this is the policy statement that will come up time and again in connection with dealing with California water matters, and I think it is of great interest to the committee.

Mr. Pfaffenberger. That is the purpose of our wishing to make the statement.

2. In operating the Central Valley Project, the United [23,768] States acting by and through the Secretary of the Interior, is an application to the State for the appropriation of water for the project, and in the use of all project water in accordance with State law and decisions of the U. S. Supreme Court and inferior Federal courts, is a trustee for the benefit of project beneficiaries, and in the dis-

posal and delivery of such water is subject to State law.

3. Section 106 of the Water Code declares that the use of water for domestic use is the highest use of water, and that the next highest use is for irrigation. Section 106.5 of the Water Code accords a preferred priority to municipal uses, and Section 1460 of the Water Code provides that an application for a permit by a municipality for use of water by the municipality or the inhabitants thereof for domestic purposes, shall be considered first in right, irrespective of whether first in time. Appropriations of water for power generation must also be secured pursuant to State law (Section 102, Water Code.) [23,769]

* * * * *

HARVEY SHIELDS

called as a witness by and on behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

The Clerk: State your full name, please.

The Witness: Harvey Shields; S-h-i-e-l-d-s.

Direct Examination

Q. (By Mr. Rowe): Mr. Shields, you are the manager of how many Fresno County Water Works Districts? A. Seven.

Q. And that includes Fresno Water Works District which includes what is known as the Figarden area north of the city of Fresno? A. Yes.

* * * * * [23,780]

(Testimony of Harvey Shields.)

Q. (By Mr. Rowe): Let me ask you this: In the year 1953 did the water level in the Fresno Water Works District No. 1, that is the Figarden area, raise or lower? A. It lowered.

Q. Approximately how many feet?

A. Well, from '52 to '53 it was approximately 10 feet.

Q. Approximately 10 feet? [23,781]

* * * * *

Q. Would you go back, say, two years to Water Works District No. 8? A. Yes.

Q. Could you give the depth of water in your wells two years ago and what it was on a comparable date in 1954?

Mr. Goldberg: Now Water Works District No. 8, is that the Figarden district?

Mr. Rowe: No, he said that is northeast of Fresno, the Tarpey district.

Mr. Goldberg: Water Works District No. 8 is the Tarpey district, Mr. Shields?

The Witness: Yes. [23,782]

Q. (By Mr. Rowe): Could you give the depth to water on a couple of comparable dates?

A. Can I refer to some notes I have?

Q. Yes.

The Court: Yes.

The Witness: I would have to guess pretty hard to do that.

(Examining notes) I have No. 8 here. Well, on March 5, '52, the standing water in the No. 1 well

(Testimony of Harvey Shields.)

was 28 feet below ground level, and on December 1st of this year it was 41 feet. [23,783]

* * * * *

Q. (By Mr. Goldberg): Is that right? I didn't hear your answer. A. What is that?

Q. Is that right, you pumped 60,000,000 gallons a year [23,791] more in the Mayfair district in 1954 than you did in 1953?

A. Yes, to the best of my recollection.

The Court: That would not be right, 480 from 520. That would be 40 million. [23,792]

* * * * *

Q. Now in each of these districts you have been pumping more each year? A. Yes.

Q. Your answer is "yes"? A. Yes.

* * * * * [23,796]

Mr. Rowe: I would like to ask at this time if Mr. Goldberg has the map of the lines of equal elevation of ground water in Fresno County for 1953 and 1954. I have written the Division of Water Resources and they tell me—well, anyway, I did not get a copy but I would like to demand it if it exists.

Mr. Goldberg: Mr. Rowe, I don't know whether it does exist. Knowing the practices of the Division, or as much as I know of the practices of the Division, I am practically positive that the 1954 one does not exist. I doubt that the 1953 one is prepared.

Mr. Rowe: I was so informed. They needed their men on more important projects.

I do call to the court's attention that in this area

of the ridge north of Fresno, under the theory of Mr. Goldberg, that Mr. Shields testified in one year there was a drop of 10.6 feet.

The Court: Are you going to argue the case now?

Mr. Rowe: No, your Honor. I just wanted to make that demand in the record. [23,853]

* * * * *

The Court: The matter will be submitted upon the filing of briefs.

How long does counsel want to file briefs?

I would suggest that it would be very helpful to the court in this instance if some agreed statement of facts could be made, which I presume is impossible, or if the parties would brief the facts. In other words, in support of your contention.

We are first met here with the question of jurisdiction as raised by the various answers.

And, incidentally, I will at this time deny the plaintiffs' motion and the plaintiffs in intervention's motion to strike the answers of the defendant officials. [23,860]

* * * * *

The Court: Well, the United States is not here. They have defaulted. I do not know why they should be treated any differently than anybody else. They have either boycotted their clients or they have boycotted the lawsuit. [23,862]

* * * * *

(Whereupon, at 3:45 o'clock p.m., the matter was submitted.) [23,864]

[Title of District Court and Cause.]

ORDER UNDER F.R.C.P. 75(i)

Whereas the parties to the appeal now pending in the within matter have not designated the entire record upon which the case was tried and decided by the trial judge, but have designated only portions thereof, and

Whereas this court is of the opinion that the entire original transcript of all testimony and the original of the entire clerk's file and all exhibits should be made available for inspection by the appellate court, under the terms and provisions of F.R.C.P. 75(i), and

Whereas the original transcript of testimony has never been filed and there remains a balance due the official court reporters thereon of approximately $1800.00, now therefore

It Is Hereby Ordered that the entire clerk's file, all exhibits, and the clerk's copy of the transcript, be transmitted by the clerk to the U.S. Court of Appeals for the Ninth Circuit, San Francisco, California, by the most feasible and convenient means, and that appellants secure and file with the appellate court the entire original transcript, including the transcript on the various hearings for temporary injunctions, duly certified by the Official Court Reporter.

Dated March 31, 1959.

PEIRSON M. HALL,
United States District Judge.

[Endorsed]: Filed March 31, 1959.

[Endorsed]: No. 15840. United States Court of Appeals for the Ninth Circuit. State of California; United States of America, et al., Appellants, vs. Everett G. Rank, et al., Appellees. Transcript of Record. Appeals from the United States District Court for the Southern District of California, Northern Division.

Filed: January 6, 1958.

/s/ PAUL P. O'BRIEN,
Clerk of the United States Court of Appeals for the Ninth Circuit.

United States Court of Appeals
For the Ninth Circuit

Excerpt from Proceedings of Monday, February 24, 1958.

Before: Pope and Hamley, Circuit Judges.

No. 15840

UNITED STATES OF AMERICA, et al.,
Appellants,

vs.

EVERETT G. RANK, et al., Appellees.

The motion to substitute parties appellant coming on regularly for hearing or submission—Mr. Claude L. Rowe, counsel for appellees, City of Fresno, et al., being present in support of said motion, and

Mr. B. Abbott Goldberg, Deputy Attorney General, State of California, counsel for appellants, being present, and on oral stipulation of said counsel,

Ordered said motion granted, and that Bernard P. Bellport, as Regional Director, Region 2, of the United States Bureau of Reclamation, and Bernard P. Bellport, individually be, and hereby are substituted in the place and stead of Clyde E. Spencer as Supervising Engineer, California Projects, United States Bureau of Reclamation, as Regional Director of the United States Bureau of Reclamation, as Director, Region 2, of the United States Bureau of Reclamation, and appellant, Clyde E. Spencer, individually, and that the pleadings in this cause be amended as to title and pleadings accordingly.

[Title of Court of Appeals and Cause.]

DESIGNATION OF POINTS TO BE RELIED UPON IN THE APPEAL BY THE UNITED STATES OF AMERICA AND DEFENDANTS-APPELLANTS BERNARD P. BELLPORT, MARTIN H. BLOTE AND EDWIN F. SULLIVAN

The United States of America and Bernard P. Bellport, Martin H. Blote and Edwin F. Sullivan, Defendants-Appellants in the above-entitled cause, hereby adopt the following points on which they intend to rely in this appeal:

1. The trial court is without jurisdiction of the United States of America in this cause and erred in

ordering the joinder of it as party defendant as it is immune from suits of this character and has not waived its sovereign immunity from suit. Moreover, the amendment to make the United States of America a party must relate back to the date the suit was initiated.

2. The trial court is without jurisdiction to violate the fundamental principles of the separation of powers and to encroach upon the powers of Congress and the President in the manner attempted by its findings of fact, conclusions of law and judgment, and erred in entertaining the cause and attempting to grant relief of that nature through the entry of the findings of fact, conclusions of law and judgment purporting to control the will of Congress and to usurp the discretionary powers of the Executive Branch of the United States of America.

3. The trial court erred in entering its judgment by reason of the fact it is without jurisdiction to enter a decree which in effect orders a physical solution as relief for the plaintiffs; in ordering the joinder of the United States of America as a party defendant in a cause in which it could neither grant relief injunctive in character against the United States nor enter a declaratory judgment against it by reason of the immunity of the United States of America from suit, and the principles involving the separation of powers.

4. The trial court is without jurisdiction of the United States of America in this cause and erred in ordering the joinder of it after approximately two

hundred days of trial for at the time when the proceeding was commenced and at all times since, the United States of America was and is immune from suits of the character here involved.

5. The trial court was without jurisdiction and erred when it proceeded to trial on the merits by reason of the want of numerous indispensable parties not before the court.

6. The trial court erred in entering its findings of fact, conclusions of law and judgment against the United States of America based upon the protracted record, because the United States of America, having defaulted, any judgment against it by the court would be limited to the complaints filed by plaintiffs and complainants in intervention. (Hereafter wherever the term "plaintiffs" is used it will have reference to the named plaintiffs, the alleged members of the alleged class, and the complainants in intervention; where the term "complaint" is used it will refer to all complaints as amended or supplemented by plaintiffs and complainants in intervention.)

7. The trial court erred in proceeding to trial on the basis of a class action by reason of the fact that the named plaintiffs were not and could not be representative of the innumerable parties for whom they purported to act, but rather were in direct and immediate conflict one against another for the waters of the San Joaquin River, the rights to the use of which were allegedly involved.

8. The trial court erred in entering judgment in this cause against the defendants by reason of the failure of the plaintiffs to prove their alleged claims as to rights to the use of water in the San Joaquin River.

9. The trial court erred in entering judgment in this cause against the defendants by reason of the failure of the plaintiffs to prove a need for water from the San Joaquin River; proving rather that lands allegedly owned by the members of the class and the named plaintiffs have a present adequate supply of water from another source.

10. The trial court erred in that the evidence before it did not support the findings of fact, conclusions of law, decisions and judgments which it entered.

11. The trial court's findings of fact were clearly erroneous and contrary to the proved facts, especially but not limited to, the movement of ground water, the geologic formations, the hydrologic phenomena and fundamental laws of nature.

12. The trial court was clearly erroneous in its findings of fact by reason of the failure of the plaintiffs and the classes they purport to represent to prove a causal connection between the acts concerning which they complain and their alleged damage.

13. The trial court erred in entering judgment in this cause against the defendants by reason of the fact that the United States of America had acquired

through purchase or through the exercise of its power of eminent domain whatever rights to the use of water in the San Joaquin River were necessary for the operation of the Central Valley Project in general and Friant Dam and its appurtenances in particular. To the extent that the claimed rights of the plaintiffs or the members of the alleged class purportedly represented by the plaintiffs, or the complainants in intervention were in conflict with the rights to the use of water exercised by the United States of America in connection with the above-mentioned Central Valley Project and Friant Dam and its appurtenances, those conflicting rights were acquired by the United States either by purchase or the exercise of eminent domain and title to those rights now resides in the United States of America.

14. The trial court erred in failing to dismiss the complaints and in entering judgment in this cause against the defendants, Bellport, Blote and Sullivan, either in their individual capacities or in their official capacities because the complaints disclosed on their faces and the records proved conclusively that:

a. As individuals they neither claimed rights to the use of water in the San Joaquin River nor performed any acts adverse to or in violation of the claimed rights in that stream of the named plaintiffs or the classes they purported to represent or the complainants in intervention;

b. As individuals the defendants neither constructed Friant Dam, the Friant-Kern Canal nor the Madera Canal, nor any other facilities or structures used in connection with the Central Valley Project; impounded none of the waters of the San Joaquin River; neither did they divert it;

c. Plaintiffs neither pleaded nor proved any claim against the above-named individual defendants.

15. The trial court erred in failing to dismiss the complaints against defendants Bellport, Blote and Sullivan alleging claims against them in their official capacities as subordinate officials of the Bureau of Reclamation by reason of the fact that the complaints disclosed on their faces and the record proves conclusively, that:

a. The named subordinate officials of the Bureau of Reclamation were at all times acting within the scope of their authority;

b. The named subordinate officials of the Bureau of Reclamation had no authority independent of that of the Secretary of the Interior who conferred upon them whatever powers they exercised and who was not a party to the cause and could not be joined;

c. The acts of impounding and diverting the waters of the San Joaquin River giving rise to this cause were all pursuant to authority derived from the Secretary of the Interior and in conformity with express Congressional authorization with ref-

erence to the construction, operation, and maintenance of the Central Valley Project.

d. The plaintiffs failed to prove a claim against the named defendants in their official capacities.

16. The trial court was without jurisdiction to entertain this cause and erred when it proceeded to trial on the merits because the Secretary of the Interior was an indispensable party to it and was not and could not be joined as a party.

17. The trial court erred in entering its findings of fact, conclusions of law and judgment in this cause against the defendants by reason of the failure of the plaintiffs to prove their claims.

18. The trial court was clearly in error when it found that the defendants had invaded the alleged rights of the plaintiffs.

19. The trial court erred when it declared that the plaintiffs had rights to the use of water in the San Joaquin River which entitled them to water from that stream required for the operation of the Central Valley Project.

20. The trial court was clearly erroneous in its findings that the waters of the San Joaquin River were available in the alleged alluvial cone allegedly created by the San Joaquin River.

21. The trial court was clearly in error in regard to the hydrological and geological aspects of the findings which it entered relative to the alleged aquifers allegedly supplying the lands of the plaintiffs.

22. The trial court erred in declaring that under the law of the State of California the plaintiffs had rights to the use of water and that the United States of America was subject to that law.

Dated this 20th day of March, 1958.

/s/ J. LEE RANKIN,
Solicitor General,
/s/ WILLIAM H. VEEDER,
Attorney, Department of Justice,
Counsel for Bernard P. Bellport, Martin H. Blote, and Edwin F. Sullivan, and the United States of America.

[Endorsed]: Filed March 21, 1958. Paul P. O'Brien, Clerk.

[Title of Court of Appeals and Cause.]

DESIGNATION OF POINTS TO BE RELIED UPON ON THIS APPEAL BY THE APPELLANT THE STATE OF CALIFORNIA AND THE APPELLANTS THE DELANO-EARLIMART, EXETER, IVANHOE, LINDMORE, LINDSAY-STRATHMORE, LOWER TULE RIVER, ORANGE COVE, PORTERVILLE, SAUCELITO, STONE CORRAL, TERRA BELLA AND TULARE IRRIGATION DISTRICTS

The appellants the State of California and the Delano-Earlimart, Exeter, Ivanhoe, Lindmore,

Lindsay-Strathmore, Lower Tule River, Orange Cove, Porterville, Saucelito, Stone Corral, Terra Bella and Tulare irrigation districts hereby designate the following points upon which they intend to rely in this appeal.

1. The trial court erred in its application of the so-called county of origin and watershed protection statutes.

2. The trial court erred in ordering the defendant districts to operate works belonging to the United States.

3. The trial court erred in establishing a class action and treating the plaintiffs as representatives of a class.

4. The trial court erred with respect to the plaintiffs in intervention, the City of Fresno and Tranquillity Irrigation District in all respects in which it erred in respect to the plaintiffs; and in addition it erred with respect to the said plaintiffs in intervention in attempting to establish rights in said plaintiffs in intervention which, if they exist at all, could belong only to individuals within said City of Fresno and said Tranquillity Irrigation District.

5. The appellants herein named hereby designate as their points on appeal each of the points to be relied upon designated by the appellants the United States, Bellport et al. in the latters' designation heretofore filed.

Dated: November 3, 1958.

EDMUND G. BROWN,
Attorney General of the State of California,
B. ABBOTT GOLDBERG,
Assistant Attorney General,
JOHN ROBERT BURTON,
Deputy Attorney General,
Attorneys for Appellant State of California,
JAMES K. ABERCROMBIE,
Attorney for the appellant districts named herein,
/s/ By B. ABBOTT GOLDBERG,
Assistant Attorney General.

Affidavit of Service by Mail Attached.

[Endorsed]: Filed November 3, 1958. Paul P. O'Brien, Clerk.

[Title of Court of Appeals and Cause.]

DESIGNATION OF POINTS TO BE RELIED UPON ON THIS APPEAL BY THE APPELLANT CHOWCHILLA WATER DISTRICT

The Appellant Chowchilla Water District hereby designates the following points on which it intends to rely on this appeal.

1. The trial court erred in ordering the Defend-

ant Chowchilla Water District to operate works belonging to the United States.

2. That the trial court erred in ordering the Defendant Chowchilla Water District to install and operate works as a condition to receiving delivery of water pursuant to its contract with the United States.

3. The trial court erred in establishing a class action and treating the plaintiffs as representatives of a class.

4. The trial court erred with respect to the plaintiffs in intervention, the City of Fresno and Tranquillity Irrigation District in all respects in which it erred in respect to the plaintiffs; and in addition it erred with respect to the said plaintiffs in intervention in attempting to establish rights in said plaintiffs in intervention which, if they exist at all, could belong only to individuals within said City of Fresno and said Tranquillity Irrigation District.

5. The appellant herein named hereby designates as its points on appeal, points 1 through 21 inclusive of the points to be relied upon designated by the appellants the United States, Bellport et al. in the latters' designation heretofore filed.

6. That the trial court erred in declaring that under the laws of the State of California the plaintiffs have rights to the use of water.

7. That as an agency contracting with the United States for a water supply under the laws of the State of California and under the laws of the United States, appellant Chowchilla Water District

is entitled to the same rights and the same protection afforded the United States.

Dated: November 6, 1958.

/s/ DENSLOW GREEN,
Attorney for Appellant Chowchilla Water District.

[Endorsed]: Filed November 7, 1958. Paul P. O'Brien, Clerk.

[Title of Court of Appeals and Cause.]

DESIGNATION OF POINTS TO BE RELIED UPON ON THIS APPEAL BY THE APPELLANT MADERA IRRIGATION DISTRICT

The appellant, Madera Irrigation District, hereby designates the following points upon which it intends to rely in this appeal:

1. The appellant herein named hereby designates as its points on appeal each of the points to be relied upon and designated by the appellants, the United States, Bellport et al., being points 1 to 21 inclusive set forth in the latters' designation heretofore filed.

2. The trial court erred in declaring that under the law of the State of California the plaintiffs had rights to the use of the water.

3. The appellant, Madera Irrigation District, as a contracting agency with the United States under the laws of the State of California and the United

through purchase or through the exercise of its States, is subject to the same rights and the same protection as may be afforded to the United States.

4. The trial court erred with respect to the plaintiffs in intervention, the City of Fresno and Tranquillity Irrigation District in all respects in which it erred in respect to the plaintiffs; and in addition it erred with respect to the said plaintiffs in intervention in attempting to establish rights in said plaintiffs in intervention which, if they exist at all, could only belong to individuals within said City of Fresno and said Tranquillity Irrigation District.

5. The trial court erred in establishing a class action and treating the plaintiffs as representatives of a class.

6. The trial court erred in ordering the defendant districts to operate works belonging to the United States.

7. The trial court erred in its application of the so-called county of origin and watershed protection statutes.

Dated: November 5, 1958.

DAVID E. PECKINPAH,
DENVER C. PECKINPAH,
HAROLD M. CHILD,
/s/ By HAROLD M. CHILD,
Attorneys for Madera Irrigation District.

Affidavit of Service by Mail Attached.

[Endorsed]: Filed November 7, 1958. Paul P. O'Brien, Clerk.

[Title of Court of Appeals and Cause.]

DESIGNATION OF POINTS TO BE RELIED UPON IN THIS APPEAL BY APPELLANT, SOUTHERN SAN JOAQUIN MUNICIPAL UTILITY DISTRICT

Appellant, Southern San Joaquin Municipal Utility District, hereby designates the following points upon which it intends to rely in this appeal.

1. The trial court erred in denying this appellant's Motion to Dismiss filed March 30, 1950.

2. The trial court erred in refusing to determine and adjudicate the only issue raised in the Complaint, as amended, which affects and concerns this appellant, to wit, the validity of the water delivery contract between this appellant and the United States of America.

3. The trial court erred in determining that this appellant had the right to add to or alter the construction of the Central Valley Project Works.

4. The trial court erred in determining that this appellant had the right to control any part of the construction or operation of the Central Valley Project at, above or below Friant Dam.

5. The trial court erred in adjudging that this appellant pay (bear) the costs of constructing, repairing, replacing and operating collapsible dams and appurtenances, including easements and rights-of-way in and adjacent to the San Joaquin River

below Friant Dam and the costs of furnishing water for ponds.

6. The trial court erred in decreeing an injunction against this appellant.

7. The trial court erred in decreeing that appellees' suits constituted class actions.

8. The trial court erred in decreeing that the rights and interests of appellees and the alleged members of their class were not adverse to each other.

9. The trial court erred in its application, as to this appellant, of the so-called county of origin and watershed protection statutes.

10. The trial court erred in decreeing that the City of Fresno would be entitled, at some time in the future, when and if it constructed unspecified and unidentified public works, to an injunction against this appellant.

11. The trial court erred in denying this appellant's Motion for a New Trial.

12. The trial court erred in denying this appellant's Motion to Alter and Amend the Corrected and Amended Judgment entered June 21, 1957.

13. The trial court erred in refusing to decree that the judgment of the Superior Court of the State of California, in and for the County of Kern, No. 52763, entitled "Southern San Joaquin Municipal Utility District vs. All Persons etc., et al.," was res judicata upon and as between appellees and this

appellant upon the only issue between them presented by the pleadings, to wit, the validity of the water purchase contract between the United States and this appellant.

14. The trial court erred in awarding costs against this appellant.

15. To the extent that appellant may be found to be aggrieved thereby, this appellant hereby designates as its additional points on appeal, each of the points to be relied upon as designated by appellants, United States, Bellport et al., in their designation heretofore filed herein on or about March 21, 1958.

Dated: November 6, 1958.

J. O. REAVIS,
IRL DAVIS BRETT,
/s/ By IRL D. BRETT.

Affidavit of Service by Mail Attached.

[Endorsed]: Filed November 8, 1958. Paul P. O'Brien, Clerk.

Office of the Clerk
Supreme Court of the United States

Memorandum

Volume VI of the record in the Court of Appeals, constituting maps, charts, photographs and other exhibits, being expensive to reproduce, need not be printed, but reference may be made by the parties in their briefs and at argument to any unprinted portions of the certified record.

Nos. 31, 51, and 115 O.T., 1961